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Vol. 3
Pennsylvania. Board of Canal
Commissioners.
Message from the Governor,
accompanied with a report of
the Canal Commissioners, and

PENNSYLVANIA ROOM

MES

FROM THE

GOVERNOR,

ACCOMPANIED WITH A REPORT

OF THE

CANAL COMMISSIONERS,

AND ACCOMPANYING DOCUMENTS.

READ IN THE HOUSE OF REPRESENTATIVES, DECEMBER 27, 1838.

HARRISBURG:

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1838.

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To the Senate and House of Representatives of the Commonwealth of Pennsylvania.

GENTLEMEN:—I have the honor of transmitting to you a copy of a letter from the president of the board of Canal Commissioners, together with a copy of the report, with the documents accompanying the same, made in obedience to law.

JOS. RITNER.

EXECUTIVE CHAMBER,
Harrisburg, Dec. 27, 1838.

CANAL COMMISSIONERS' ROOM,
December 21, 1838.

His Excellency, JOSEPH RITNER,
Governor of Pennsylvania.

SIR:—By order of the Board of Canal Commissioners, I transmit to you their annual report, with the accompanying statements and documents.

Very respectfully,
JOHN DICKEY,
President.

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REPORT.

The Canal Commissioners respectfully submit the following report:

In obedience to the injunctions of the law passed the 14th day of April, 1838, entitled "An act to provide for the repairs and continue the improvements of the State by canal and rail roads," the Canal Commissioners have put under contract about 124 miles of canal and rail road, viz:

Erie extension, (Shenango line,)	18½	miles.
" " (Conneaut line,)	11½	"
North Branch, (Tunkhannock line,)	28	"
West Branch, (Sinnemahoning line,)	33	"
Gettysburg rail road extension,	6½	"
Alleghany feeder,	14	"
Wisconisco canal,	12½	"
	124	

The several lettings were fixed at the earliest period practicable for the engineers to have their lines prepared, and for the board to attend them successfully. In addition to these lettings the board have placed under contract the laying of six miles of rails on the line of railway to avoid the inclined plane at Columbia—the construction of the inlet at Petersburg on the Juniata division—the extension of the arch at Grants' Hill Tunnel—and the outlet lock at Duncan's Island. The superintendents of the different lines have re-let at different times several sections of canal and rail roads, &c. which were revised and examined by the Canal Commissioners.

Having presented the general operations of the board under the act of the 14th of April, 1838, they now proceed to detail the operations on, and condition of each division of the public works, and under the appropriate head of extensions, describe the new work directed to be placed under contract.

Before doing so the board would here observe, that two of their number left the seat of government on the 14th of June, to make a personal inspection of the public works, settle and adjust claims for damages, and attend the respective lettings. They had proceeded as far as Williamsburg, in Huntingdon county, where they witnessed one of the most d structive floods, which has ever occurred in the Juniata river, in its progress destroying an immense amount of pro-

perty belonging to individuals, and overflowing, breaking, and destroying a great portion of the public works, between Hollidaysburg and Huntingdon, a distance of thirty-nine miles. A description of the injury done to the public works, of the measures taken to repair them, and the cost of the repairs, will be found in another part of the report under the head of the Juniata division.

DELAWARE DIVISION.

The water was introduced into this division on the 24th of last March. The navigation has been uninterrupted during the season, with the exception of a few days in the latter part of August for the want of water. Expensive repairs were made during the winter, and early in the spring, viz: constructing new lock gates, re-lining locks, re-building and renewing the superstructure of acqueducts, and re-building bridges. The amount of these repairs has been large, much of the repairs being for new work; a specific appropriation should have been made. The structures of wood having been for the most part renewed, with the exception of the superstructure of one of the acqueducts, but little repairs will be required on this division for years to come, unless some extraordinary breach should occur.

This division is destined to become one of the most profitable portions of the public works, owing to its connection with the improvements of the Lehigh company, extending by canal and rail road now nearly completed to the Susquehanna at Wilkesbarre, and to the mining operations of the Mauch Chunk, Beaver Meadow and other coal companies which depend upon it for an outlet to market. The growing and increasing demand for coal and iron, will render it necessary at no distant period, to increase the capacity of this division by the construction of additional locks along side of the present ones, of dimensions corresponding with those of the Lehigh, adapted to boats of 100 tons. The capacity of the canal being thus increased, an additional supply of water may become necessary. This could be obtained by the construction of a feeder taken from the Delaware at Catbush island.

The project of constructing outlet locks at Black's eddy, so frequently urged upon the legislature, if carried into effect would render comparatively useless the balance of the division to Bristol. It would give to a sister state and rival city, all the benefits to be derived from a connection with the Lehigh improvements and mining interests, a project which the board deem opposed to the true policy and best interests of the state, and if adopted, would render the enlargement of the canal unnecessary and unprofitable.

The cost of repairs during the year amounts to $38,095 09

The amount of tolls received on this division during the the fiscal year amounts to 84,435 22

PHILADELPHIA AND COLUMBIA RAIL ROAD.

Motive Power Department.

The operations on this important link in our public works have been conducted with entire success during the past year. The motive power has more than defrayed its expenses. The number of engines has been found adequate to the amount of business, but an increased number will be required for the ensuing year.

The excess of motive power receipts over the expenditures will create a fund sufficient for the purchase of the necessary engines hereafter; of this there can be no doubt, when we take into view the economy and saving which will be effected by the substitution of anthracite coal for wood as fuel. The experiments which the board directed to be made, have established the fact that anthracite coal can be successfully used as fuel, in propelling at any required speed the locomotive engine, while its use will add to the security of the passengers, and the safety of the property of persons bordering on the road. There has been transferred by direction of the former board, six engines to the Allegheny portage road, leaving but twenty-seven effective engines for the use of this road. The superintendent considers the addition of ten engines as necessary for the business of the ensuing year; these would cost $70,000. There will also be required for the purchase of ropes, the sum of $4,000. For further particulars the legislature is referred to the report of the superintendent of motive power, A. Mehaffey, Esq.

Amount of motive power tolls,	$164,052 74
Amount of expenditures, (deducting stock of fuel &c. on hand,)	123,820 94
Amount of excess,	$39,231 80

OF REPAIRS AND CONSTRUCTION OF NEW WORK.

The sum of $50,000 was appropriated toward the expense of renewing 22½ miles of the northern track next to Philadelphia. That part between Broad street and the foot of the plane, has been nearly all re-laid with edge-rails the past season, and workmen are now employed in completing it. But little has been done west of the plane for want of the materials, part of the iron contracted for has but lately arrived from England. The cost of renewing this track in addition to the sum already appropriated is estimated at $109,281 05. The work might progress gradually, so as to be completed within two years. The board would therefore recommend the appropriation of $100,000 for the operations of next year.

The bridge over Valley creek, destroyed by fire, has been replaced by a new and substantial bridge, built upon the lattice plan, and has cost $12,411 09. The temporary bridge first erected cost more

than was expected, and the whole exceeds the amount appropriated of $15,000, by the sum of $2,218 13½. A law passed at the last session, requiring the Commonwealth to keep in repair and rebuild all bridges through the city of Lancaster. In the summer of 1836, one of the bridges over which the New Holland turnpike crosses fell down, and has not since been rebuilt. The amount required to rebuild it, is estimated at $1,340, for which sum an appropriation will be necessary. A further appropriation will be required of five hundred and ninety-one dollars, to finish the embankment at Smithes bridge, and five hundred dollars to rebuild a bridge at Reesville.

The operations upon the Schuylkill incline plane have been carried on successfully throughout the season; the capacity of the plane being more than adequate to the amount of business.

The amount of rail road tolls during the present year,	$233,588 75
The cost of repairs, (exclusive of the appropriations to new work,)	44,033 23½

LINE OF RAILWAY TO AVOID COLUMBIA PLANE.

The completion of this work has been delayed longer than was anticipated, by the scarcity of hands, and the sickness that prevailed on several sections. This improvement will cost more than was estimated last year, and will exceed the appropriations the sum of $69,000, including the cost of depot and smith shop, and grading a street back of the collector's office, and which, although not properly items in the cost of the railway to avoid the plane, are rendered necessary in consequence of it. The excess of cost is accounted for in the accompanying report of the engineer, J. P. Baily, Esq.

Believing that it would be of the utmost importance to the state, if the cast iron rail could be substituted for the malleable or wrought iron rail, the board, after a careful examination of Cooper's patent American cast iron rail, determined to make the experiment to test its usefulness, and directed one fourth of one mile of the road to avoid the plane, to be laid with the rail upon Cooper's plan. This rail will cost, when laid, less than the iron edge or T rail. That the experiment will prove successful the board have but little doubt, but in the event of a failure, it was well worth making, when we take into consideration the importance of it to the iron, and other interests of Pennsylvania.

Amount of appropriations made at different times to the railway to avoid the plane at Columbia,	155,000 00
Amount required to complete,	69,000 00
Whole cost of avoiding the plane,	$224,000 00

EASTERN DIVISION.

There has been an interruption to the navigation on this division the past season. A scarcity of water for two or three weeks during the driest part of the season, was experienced on the lower end of the division, caused by a want of sufficient water in the Swatara feeder. It may become necessary at a future period, in order to accommodate an increased trade, to bring in a feeder from the river at Conewago falls. Locks Nos. four and seven will require to be in part taken down and rebuilt, with a set of new gates to each, which may cost about $3,000.

The delay and interruption heretofore experienced at and near Duncan's island, have been overcome by deepening the two feeder levels, and repairing the dam at Clarke's ferry; and when the locks now in progress are completed, will remove all difficulty to the navigation in future. Two of the locks will be completed this season, viz: the lift lock and lower guard lock. The work on the upper guard lock has been suspended for want of funds, (and the contractors have since abandoned it.) The appropriation for these locks will not be sufficient to complete them; it will require an additional sum of $16,000. The cause of this increased expense in their construction, over the estimate of last year, is explained in the report of the engineer, J. P. Baily, Esq.

The bridge at Duncan's island was passable in March last, and is now entirely completed. The whole cost including ice breakers above each pier, is $92,567 81. This is one of the best structures in the state, combining strength, neatness, and durability, with all the requisites for towing boats, and accommodating the travel of the country. The plan and execution of this work reflects the greatest credit upon the engineer who designed, and the enterprising contractors who executed it. The repairs of the dam have been completed, and the appropriation found adequate, the cost has been less than the estimate.

The aqueduct over the Juniata river, near Duncan's Island, under the care of the supervisor of the Eastern division, will require to be renewed before the water is let on in the spring. The trunk has been supported during the past season by trustles. To renew the trunk will cost, at estimate of Engineer, $14,000.

Estimated cost of Locks below Duncan's Island,	$35,000
Amount appropriated,	$19,000
Amount required to complete,	$16,000

OUT LET LOCK AT DUNCAN'S ISLAND.

This work has been placed under contract, and the contractors are at work getting out materials for it.

Estimated to cost	$10,000
Amount appropriated,	$10,000
Amount required to complete,	$6,000

The repairs on the Eastern Division other than for new work and feeder dams, drawn from the Treasury, amounts to $29,939 69

JUNIATA DIVISION.

The whole of this division was kept in good navigable order until the 19th of June last, when the greatest disaster happened that has herethfore befallen the public works. An unprecedented rain fell in the course of a few hours, in the neighborhood of Hollidaysburg, swelling the Juniata into a mighty torrent, which in its course swept off fences, bridges, forges and houses, destroying and rendering useless that portion of the division between Hollidaysburg and Huntingdon; a distance of 39 miles. The extent of injury done to the public works could only be realized by a personal inspection of the line. Some idea may be formed from the time it has taken to repair the breach, and the magnitude of the repairs. Twelve locks may be said to have been built entire, part of the walls of a few of them, towards the foundations, answered to build on, but the labour required to clear off, so as to get at the work was an equivalent to an entire rebuilding. Seven other locks required great repairs. Two large aqueducts across the Juniata have been rebuilt, together with their piers, four towing path bridges across the river. Six dams were almost entirely rebuilt, and four others were much injured. For a more full account of the extent of the injury and amount of repairs, the board would refer the legislature to the report of the Engineer, J. P. Bailey, Esq.

The plan adopted by the board, for repairing the breach, with the least delay, and in the best manner, was to divide the line into three sections, and appoint supervisors to each section, whose duty it was employ workmen, furnish materials, and under the direction of the Engineer superintended the work. They were authorized to employ at each dam, lock and aqueduct to be rebuilt, a foreman, and principal carpenter and mason. From the magnitude of the repairs to be made, and the heavy disbursements, a disbursing officer was appointed to make monthly payments, a superintendant to furnish materials, and necessary supplies was also appointed for the whole line.

At the time the breach occurred the appropriation of $280,000 to the repair fund was nearly all expended by the heavy repairs made on the various lines during the winter and spring in preparing the canal for navigation.

The governor having wisely determined not to convene the legislature, on account of the extra expense, and the delay it would cause; and the president and directors of the Bank of the United States

agreeing to furnish the funds necessary to repair the breach, there has been no want of means. The superintendent received the monies upon the warrant of the Governor, and his accounts have been deposited for settlement with the Auditor General.

The board had expected the repairs to have been completed, and the water let into the canal some time in the month of October. In this anticipation they have been disappointed, caused by the delay in rebuilding the aqueduct near Spang's, and the more recent falling down of the bulk head of one of the abutments of the dam near Huntingdon. The water was let into the canal, and the navigation resumed on the 21st day of November.

To prevent the trade from being diverted, and to retain it within our own borders, the board directed the tolls to be taken off from Hollidaysburg to Duncan's Island, a distance of ninety miles, on all goods transported from Philadelphia to Pittsburg, and from Pittsburg to Philadelphia, and subsequently took off the toll on passengers. These measures enabled the transporters on our public works to continue their operations by the employment of Wagons between Huntingdon and Hollidaysburg.

From Duncan's Island to Huntingdon the navigation has been uninterrupted. Heavy expenditures were made during the winter and spring on this division, repairing locks, renewing lock gates, rebuilding bridges, putting in a new span in the Shaversford aquednct, and new machinery and rope at the Millerstown ferry. It is the opinion of the board, that this ferry should be dispensed with, and a towing path bridge erected—constructed in such manner as to accommodate the travel of the country.

The cost of repairs on this division, independent of the *breach*, amounts to	$30,880 44
The cost of repairing the *breach* above Huntingdon up to the 1st of December, per report of superintendent,	320,000 00
The amount required to complete the repairs of the *breach* estimated by the superintendent at	25,000 00
The amount of tolls received on this division, and on the eastern division which embraces the whole line from Columbia to Hollidaysburg,	194,073 75

ALLEGHANY PORTAGE RAIL ROAD.

Motive Power.

It was expected that the motive power tolls this year would be adequate to all the demands that would be made upon it. That it has not been so is to be attributed to the breach in the canal above Huntingdon, which has operated injuriously to the road. After the break, business almost ceased. The interests of the State required that the road should be kept open. The expenses were reduced as

much as possible, but from the nature of its construction, it cannot be reduced below a certain point. A given number of men are required at each plane, and it requires nearly as much fuel, and as many men to pass seventy cars as it does to pass 15". The amount of the business done upon the road up to the time of the break, was sufficient to pay the expenses while operating, together with the expenses during the winter when not in operation, and have a balance on hand of near $16,000. The expenses in the months of July, August, September and October, exceeded the tolls $16,500, which with $3,500 paid for a locomotive engine, brought from the Columbia rail road, exhausted the balance on hand at the time of the breach, and left a balance on hand of $982,40, the excess of expenditures over the amount of tolls. It is found that locomotives work on the short levels with much greater advantage than horses, both as regards economy and the despatch of business. Six new engines might be profitably added to the force on the road next season, their cost would be $42,000.

Amount of motive power tolls received at Hollidaysburg during the fiscal year,	$14,517 60
Amount received at Johnstown,	36,000 60
	80,518 20
Motive power expenses during the year,	81,500 00
Expenditures over income,	981 80

REPAIR DEPARTMENT.

The expenses for repairs have been large. The road is in good condition, with the exception of the tracks on the inclined planes, these will require to be renewed shortly, and it should be done with the edged rails. The tracks may with some difficulty be kept in order during the next season. The cost of procuring materials and laying double tracks of edge rails on all the planes is estimated by the engineers to cost $111,950.

There has been received for tolls collected during the present year.	$73,774 98
The amount expended in repairs during the same period	33,852 04

WESTERN DIVISION.

There has been but little interruption to the navigation on this division during the past season, with the exception of a scarcity of water for a few weeks. The water was so low that the levels could not be kept sufficiently full for the passage of freight boats, in consequence of which goods were detained some time at Johnstown, after reaching that point.

The summer has been an unusually dry one. The drought has been general over the State, earlier in the eastern, and later in the western part, affecting all our rivers, and causing a scarcity of water on most of the Divisions of our public works. The water has not been so low for years, nor for so long a duration. Our public works have heretofore suffered from this cause, and will hereafter, unless we guard against its recurrence. From past experience we cannot rely upon the supplies furnished by the Conemaugh, and the upper Juniata in a dry season. Reservoirs will have to be constructed (or some other mode adopted to overcome the difficulty) on each side of the Allegheny mountain. Reservoirs are deemed practicable. The Legislature, aware of the importance of constructing them, appropriated money at the sessions 1834--35 and 1835--36, for their commencement. They were not commenced for the reasons assigned in the reports of the Board of Canal Commissioners, made in 1836 and 1837.

These reservoirs are absolutely necessary, and should be commenced and finished as soon as practicable, either upon the plan and location designated by Sylvester Welch, in his report made on that subject in 1835, or some other plan. The Board would therefore recommend a liberal appropriation to be made for this object.

The amount of repairs made during the winter and spring was heavy—but few will be required next season.

The extension of the arch at Grants' Hill tunnel authorised by the act of the 14th of April, 1838, has been placed under contract, and the work is now progressing.

The amount expended in repairs during the present year is	$52,404 75
The amount received from tolls during the fiscal year,	$116,130 92

SUSQUEHANNA DIVISION.

This Division has been kept in good condition generally. In August the water had fallen so low in the pool of the Shamokin Dam, as to occasion some difficulty in passing boats at a few points on the line. A temporary dam was constructed in the customary mode, which proved successful in furnishing the necessary supply. The Shamokin Dam has been undergoing repairs during the summer, upon the plan recommended by J. D. Harris, in his report of last year, and $6,600 have been expended. The permanent repair of the dam should be completed next season, for which purpose the balance estimated will be required.

The Aqueduct across Middle Creek, is in such a state of dilapidation, as to need expensive repairs. The aqueduct is 288 feet in length between the abutments, The cost of rebuilding it on a new site is estimated at $15,000, and to repair it in a permanent manner on the present site $10,000. Three farm bridges will require renewal. The towing path abutment and superstructure of a new public bridge

will require to be built; and the towing path and road bridge at the ferry oppo site Sunbury, must be renewed.

The amount estimated for extraordinary repairs on this division is estimated at $30,937 00

There has been expended for ordinary repairs on this division during the present year $11,595 09

NORTH BRANCH DIVISION.

Some difficulty has been experienced in supplying the Canal with water, owing to its imperfect construction originally. The Nanticoke dam will be permanently repaired this season, and will cost $6,000.

Eight locks on this division were originally constructed of wood; they are so much decayed that they cannot be depended upon for another season, and will require to be rebuilt. The cost of rebuilding them of stone is estimated at $80,000. The Board are of the opinion that locks built upon the combined plan (wood and stone) ought to be substituted for the present ones, and placed along side of them, so as not to interrupt the navigation. The combining lock will cost but little over half the price of the stone lock, and possesses the advantage of being repaired with facility at all seasons of the year.

The amount estimated for extraordinary repairs on this division within the next year is:

For rebuilding Locks,	$40,000 00
For rebuilding Bridges,	2,000 00
	$42,000 00
For ordinary repairs of aqueducts, wiers, &c.	17,000 00
There has been expended in repairs and in payment of old work on finished lines	$9,374 00
For repair of Nanticoke Dam,	$5,000 00

WEST BRANCH DIVISION.

This division of the public works has been in good order since the opening of the navigation in the spring, with the exception of a few inconsiderable breaches, and the interruption occasioned by the extreme drought, in the latter part of September and beginning of October. For the permanent security and safety of the Muncy Dam, and the Dunnsburg Dam, the principal engineer, who has charge of this division, recommends that they be strengthened during the next season, by adding to them cribs on the lower side, constructed in the manner described in his report. The cost of these cribs is estimated at $33,000. The estimate for repairs on this division, and which may be termed extraordinary, is $4,800, independent of the cost of the cribs.

The amount expended for repairs on this division during the past year, is $52,225 29

The amount received for tolls on the Susquehanna, North Branch, and West Branch Divisions, during the fiscal year ending on the 31st of October, 1838, is $31,061 45.

The annual amount expended in repairs is heavy, but to obtain the objects and produce the results which were expected in the original construction of our canals, it becomes necessary that they should be repaired, and rendered as perfect as practicable. Canals have been constructed at the expense of the Commonwealth up the Susquehanna from Duncan's Island to Northumberland, and thence up both branches. One of the improvements extending to the Anthracite coal mines on the North, the other to the Bituminous mines on the West branch. That the state may derive all the benefits from the out lay in those works, to which she is entitled, they should be kept in good repair. This is necessary to give confidence to transporters, and to encourage the investment of capital in mines and manufacturies—all tending to augment the tonnage and tolls on the Canals.

BEAVER DIVISION.

The act of the 14th of April, 1838, authorized and required the board of Canal Commissioners to make such repairs as might be necessary to preserve the dams and locks on this division, and the French Creek division, and the French Creek Feeder. A resolution of the board was passed requiring C. T. Whippo, the engineer, to report the amount of repairs necessary for that purpose. In conformity with that resolution he reported the amount necessary for the different divisions. The board directed the supervisor on this division to expend the sum of $8,000 in making the repairs recommended by the engineer.

This division has suffered much from the floods of past years, and although much has been expended in ordinary repairs, and to preserve the dams and locks, yet it will require a large sum to make substantial and permanent repairs, so as to have uninterrupted navigation.

The Pennsylvania and Ohio Canal, which connects the public works of Ohio with those of Pennsylvania, forms a connexion with this division two miles below the town of New Castle. The Erie Extenson also connects with the Beaver division, six miles above New Castle. Forty miles of the Pennsylvania and Ohio canal to the town of Warren, it is expected will be finished early next spring, and the whole distance of ninety miles within a year; thus completing an entire water communication by canal from Portsmouth, on the Ohio river, to the Ohio river at the mouth of Beaver, and thence by the river to the city of Pittsburg. Forty miles of the Erie Extension from New Castle to Greenville may also be completed during the next season. The completion of these improvements renders it necessary that the repairs of this division should be made next season, in order to accommodate without interruption the trade which will be thrown upon it. When the connexion with the

Ohio canals shall have been completed, and the extension to Erie finished, this division will be found to be profitable.

The amount of repairs to render this division permanently useful is estimated at	$40,572 00
The amount expended during the last year in ordinary repairs is	2,500 00
And to preserve the the dams and locks,	8,000 00

The bridge over the Shenango, at the town of Newcastle, authorized to be extended by a resolution passsed at the last session, has been placed under contract, and the work is now in progress.

FRENCH CREEK DIVISION AND FRENCH CREEK FEEDER.

The same measures were adopted in relation to this division, that were directed relative to the Beaver division, and the Supervisor was directed to expend the sum of $6,000, in making the repairs recommended by the engineer, to preserve the dams and locks. Injuries from similar causes, but to a much greater extent than those on the Beaver division, have occurred on this, and heavy expenditures become necessary to put the feeder and canal in good order. The amount is estimated by the engineer for the French creek feeder at $86,403 00, and the French creek division at $76,052 00.

From the lowness and great extent of the flats bordering on the French creek, the erection of dams has caused their overflow in ordinary rises of the stream, by which the owners of land have sustained great injury. The Sugar creek dam causes the greatest injury, overflowing the greatest quantity of land. It appears that ever since the erection of that dam. (some four or five years) the owners of land have annually lost their crops, until the present year. Some of the owners of these flats were induced to believe, from the representations made at the time of the erection of the dam, that their lands would not be injured, and have released or settled their claims for small amounts—others of them have not received any thing for damages.

The owners now present large claims for the loss of their crops, for several years, as well as for injuries done to their land. This class of claims, if once recognized, must continue to be expected as often as these floods occur, which may be annually.

Some remedy should be afforded these claimants, either by removing the cause of their grievances, or paying them the full value of their lands overflowed. In reference to this subject, the Board directed the engineer having charge of the division, to make a survey for the purpose of ascertaining the practicability and cost of avoiding the Sugar creek dam. By a reference to his report, it will be perceived that by making a separate canal, a distance of three miles, two hundred and eighty-three perches, at an expense of $58,711 00, it may be avoided, or if the dam were lowered two feet and extended

two hundred feet, the lock at the head of the pool lowered, and the channel excavated two feet deeper, it might answer the purpose, and could be done for much less expense than a separate canal. The amount of land overflowed, as appears by the report of C. T. Whippo made in 1837, was 1,470 acres valued in the aggregate at $29,000. A statement of the claims presented to the Board, is appended to this report.

The repairs on this division should be made during the next season, so much at least as to secure a navigation from Meadville to Franklin. For this purpose the feeder dam at Bemus' mill must be re-built, or in the event of a new location, and a new dam being authorized by the Legislature, then the new dam must be erected.—It will cost less to repair the feeder dam at Bemus' mill than to build a new one.

The amount expended in repairs on this division during the last year, is	$5,732 00
To preserve dams and locks,	6,000 00

TANGASCOOTACK EXTENSION.

This extension, seven and a half miles in length, has been completed, with the exception of the wier and one abutment of dam No. 2, at Farrandsville. This dam has been suspended, until the foundadation of the out-let lock of the Sinnemahoning extension shall be finished. The Sinnamehoning extension connects with the slack water formed by this dam. The navigation is complete to the mouth of Lick run at Farrandsville.

There has been expended on this extension during the past year $25,590 58.

ERIE EXTENSION.

Under this head is comprehended the whole line of canal and slackwater, from the head of the pool, six miles above New Castle, to the harbour of Erie. It has been divided into two principal divisions, viz: Shenango line, and Conneaut line.

SHENANGO LINE.

This line commences at the had of the pool, six miles above New Castle, and extends up the Shenango valley to the mouth of Crooked creek, thence by the Crooked creek valley, the Pymatuning Swamp and Beaver dam summit to the termination of the French creek feeder, at the outlet of the Conneaut lake. This line is subdivided into two divisions, viz: line put under contract in 1836, and line put under contract in 1838. The part under contract in 1836 is 45½ miles in length, the lockage 175½ feet, divided into 47 sections. There are 26 locks, 5 dams, 3 aqueducts, with the accessary wiers, bridges, cul-

verts, and lock-houses. About two thirds of the work is done, and had it been possible to procure hands at any reasonable rate, it might have been much more advanced.

If early appropriations are made, this part of the line may be finished by the 1st of September next. The locks on this line are built of cut stone, and in the most substantial manner.

LINE PUT UNDER CONTRACT IN 1838.

This line commences at the mouth of Crooked creek, and follows the valley of that stream by Pymatuning swamp and Beaver dam summit, to the termination of the French creek feeder, at the out-let of Conneaut lake, and is 18½ miles in length, divided into 37 sections, and numbered consecutively with that part under contract in 1836, from 48 to 84. There are 18 locks, with necessary wiers, bridges, and lock-houses. The sections and locks have been placed under contract. At Hartstown there is a reservoir containing upwards of 400 acres, embracing the whole southern portion of the Pymatuning swamp. This reservoir will be ten feet deep above bottom of the canal, giving six feet of available water, and will be of vast importance in supplying the lower portion of canal during dry seasons. At Conneaut lake there will be an extensive reservoir formed. The surface of the lake is to be raised eleven feet, or seven feet above the bottom of the canal, which permits three feet to be drawn off for the purpose of Supplying the Conneaut and Shenango lines during a scarce time of water.

In order to prevent sickness about this reservoir, it was deemed proper to clear the timber off from all the land which will be overflowed. The clearing of this land was divided into sections, and let at Hartstown, on the 12th of September last. A more particular description of the reservoir, the number of acres it contains, and the quantity of water it will afford for the supply of the canal, will be found by a reference to the report of C. T. Whippo. Nine of the locks are to be built of cut stone, and nine of them of wood and stone combined.

CONNEAUT LINE.

This line commences as before stated at the Shenango line near the Beaver dam summit. It has been heretofore called the Western route, and under that name was surveyed and reported upon in 1836. Its length is 45.4 miles. Lockage 509.38 feet. 11.5 miles of the most difficult portions were put under contract in July last, together with 13 locks. All the locks have been abandoned except three. The sections are all in progress except two, and some of them have been prosecuted with great energy.

The sections under contract comprise all the difficult portions upon the line. That at Conneaut summit is very heavy, on account of the depth of the cutting, and the difficulty of draining off the water.

The heavy embankments at East Branch of Conneaut, at Elk, and Walnut Creeks, will be attended with great expense. These streams are subject to high floods. The culverts therefore require to be large. Fortunately the stone for these structures, can be found within a reasonable distance of the work. The mason work of the culverts is to be laid in the most substantial manner.

On account of the difficulty in procuring stone between the valley of Conneaut Creek and the town of Erie, the Board have determined by a resolution to that effect, to build a portion of the locks upon the combined plan, and another portion of them entirely of wood upon the plan described in the report of C. T. Whippo, Esq.

The wooden lock will last some eight or ten years, and in the mean time stone can be procured by water at a moderate expense, for new ones.

The Conneaut line is divided into 62 sections. There are 71 locks, overcoming 509.38 feet rise from 7½ feet below the surface of water in the bay. There are nine culverts, besides bridges, wiers and lock houses. The estimated cost of the whole line of 45.4 miles, is $1,700,399 79.

A statement showing the estimated cost of all the lines on the Erie Extension, together with the amount of monies appropriated, and the amount of money required to complete.

SHENANGO LINE.

Contracts entered into in 1836. 45.5 miles. 175.5 lockage, estimated to cost	$987,723 34
Amount appropriated by act of Feb'y 15th, 1836,	200,000 00
" " " resolution June 16th, 1836,	100,000 00
" " " act of 9th of Jan'y, 1838,	100,000 00
" " " " 14th of April, 1838,	200,000 00
" " " pro ratio of the temporary loan authorised by same act,	66,666 66
	666,666 66
Amount required to complete 45.5 miles,	$321,056 67½
Contracts entered into in 1838.	
" 18½ miles, 109 feet lockage estimated	$643,471 08
Amount appropriated, by act of 14th April, 1838, and apportioned to this line	40,000 00
Amount required to complete 18½ miles,	603,471 08
The whole amount required to complete the Shenango line, as estimated,	$924,527 75½

CONNEAUT LINE.

Contracts entered into in 1838, 11.5 is estimated to cost	$741,894	46
Amount appropriated by act of the 14th of April 1838, and apportioned to this line,	60,000	00
Amount required to complete the 11½ miles placed under contract,	681,894	46
The whole estimated cost of the Erie extension,	3,331,554	21
Whole amount appropriated,	766,666	66⅔
Whole amount required to complete is,	$2,564,867	54⅓

NORTH BRANCH EXTENSION.

Tioga Line.

That part of the North Branch division between the State boundary and Wyalusing creek, is termed the "Tioga line" and is forty miles and ten chains in length. Of this line thirty-five miles and ten chains were placed under contract in October 1836, beginning at the town of Athens, (four miles and thirty-four chains from the State line) and terminating at Wyalusing creek. The work on this line has been prosecuted during the past year with as much activity, and as much progress has been made as the appropriation would warrant. For a more full and detailed account the legislature is referred to the accompanying reports of J. D. Harris, engineer.

One of the great objects in view, in authorizing the extension of the North Branch division from Lackawanna to the State line, was to form a connexion with the canals of that State, and open a new market, and another out-let for the Anthracite coal of the Wyoming valley. A connexion may be made with the Chenango canal at Binghampton, in Broome county in that state. Bringhampton is a flourishing town at the mouth of the Chenango river, the termination of the Chenango canal. This canal forms a connexion between the Susquehanna at Binghampton, and the Erie canal at Utica, and is about ninety-six miles in length. The distance from Binghampton to the State line near Athens is forty miles.

A connexion may also be had by the may of the Chemung valley, and if made would form a junction with the Chemung canal at Elmira, and with the Erie canal at Montezuma. The distance would be about twenty miles.

During the last summer, a survey was made in pursuance of an act of the legislature of New York, by an Engineer of that State, to

determine the route, and probable expense of a canal from Binghampton to the State line near Athens.

The Board are not advised of any other measures having been taken by the constituted authorities of New York towards forming a connexion with our Public Works. The Board have presented this subject to the consideration of the Legislature, that some measures may be adopted to secure the connexion of our Public Works with those of New York. From the enlarged views and liberal policy of the Legislature of that State, the Board cannot doubt for a moment, but that on a formal and authorized application, the necessary legal enactments would be made to secure a connexion so important and beneficial to both States.

Estimated cost of the Tioga line placed under contract in 1836, 35 miles, 10 chains is		$1,387,086 55
Amount appropriated by the act of February 15th 1836,	$150,000	
" " Resolution of June 16th 1836	100,000	
" " Act of January 9th 1838	100,000	
" " " April 14th 1838	200,000	
Pro rata of the $200,000 Temporary loan,	66,666 66⅔	
		$616,666 66⅔
Amount required to complete 35 miles 10 chains (Tioga line,)		$770,419 88⅓

The estimated cost of forming a connexion with the New York improvements at the State line, a distance of 4 miles, and 34 chains is $182,244 25.

TUNKHANNOCK LINE.

The Tunkhannock line begins at Wyalusing Creek, and extends to Lackawanna Creek, at the head of the Wyalusing Valley, where it forms a junction with the finished Canal on the North Branch. The length of this line is 54 miles and 19 chains. The location was completed in June—the first section was designated as 59 numbering the sections consecutively from Athens to Lackawanna. For a particular description of the character of the work, the Legislature is referred to the report of the Engineer, J. D. Harris, Esq.

By the Act of the 14th of April 1838, the Board was authorized to put under contract the most difficult portions of what is now designated the Tunkhannock line, and accordingly the heavies: sections were let on the 31st day of July last, and placed under contract. The aggregate length of the sectionss placed under contract, is 28 miles, 28 chains.

It was not thought expedient to let any of the mechanical structures, as that part of the work can be employed as soon as the heavy sections. Most of the Contractors are prosecuting their jobs with a pretty large force. The amount of work done was estimated in the month

of October at $16,322 00, a detailed statement of which is given in the accompanying report of the Engineers.

Eestimated cost of the work placed under contract in 1838, 28 miles, 28 chains, is	$1,400,000
Amount appropriated by act of 14th April 1838, is	100,000
Amount required to complete is	$1,300,000

The whole estimated cost of the Tunkhannock line when completed is $2,053,951 21

The whole estimated cost of the North Branch extension including the estimated cost of forming a connection with the New York improvements is $3,738,982 01

The whole amount of appropriations is 716,666 66⅔

Am't required to complete North Branch extension $2,022,315 34½

GETTYSBURG EXTENSION—PENNSYLVANIA RAILWAY.

This work has been progressing steadily during the past year. Of the 22½ miles placed under contract in 1836, some sections of grading have been completed, some others will be finished in the course of a few months, and the remainder if vigorously prosecuted may be finished in eighteen months. Of the fifteen culverts, eleven of them are finished and four of them remain to be completed. The viaduct over North Marsh creek, was re-let early in the summer, and to give to it more permanency the character of the masonry changed. The re-letting of this work has caused some delay in the prosecution of it, but it may be finished early next season. The excavations are difficult, and on account of the material, large portions being rock of close texture and very hard, a greater length of time is required to make them.

By the act of 14th April 1838, the board were authorized to put under contract eight miles, extending westwardly in the direction of Waynesburg. This has been located and divided into fifteen sections. Three of these sections requiring revision have not been placed under contract. The grading of which, together with the necessary masonry on fifteen sections is estimated to cost $204,556 82.

When this improvement is connected as originally contemplated with the Baltimore and Ohio rail road, extended as it will be to the Ohio river, at Wheeling and Pittsburg, it cannot fail to be useful and beneficial to the state, diverting as it must a portion of the trade of the valley of the Ohio and Mississippi rivers to the city of Philadelphia.

The estimated cost of completing twenty-two and a half miles, placed under contract in 1836, is	947,084 86

Amount appropriated by the act of Feb. 15th, 1836, is	$200,000	
By the act of January 9th, 1838,	45,000	
By the act of April 14th, 1838,	195,000	
Pro rata of the $200,000, temporary loan authorized by the act of April 14th, 1836,	66,666 66⅔	
		506,666 66⅔
Estimated amount required to complete,		$440,418 19⅔
The estimated cost of the work placed under contract in 1838, six and a half miles, is		204,556 82
Amount appropriated by the act of April 14, 1838,		10,000 00
Estimated amount required to complete,		$194,556 82

WEST BRANCH—SINNEMAHONING EXTENSION.

The act of the 14th of April, 1838, directed the Canal Commissioners to locate and put under contract, a canal or slack-water navigation from the termination of the Tangascootack extension to the mouth of the Sinnemahoning. The line now designated as the Sinnemahoning extension, was located to within forty rods of the mouth of the Sinnemahoning, with the bottom eighteen feet above the surface of low water. No arrangements were made for feeding the first six and a half miles, the extension being viewed by the engineer, as a part of a longer line to be continued up the West Branch or Sinnemahoning. At six and a half miles from the commencement is placed the outlet lock, and the navigation thence continued by a pool of two miles, to the dam that will feed the canal, to the Tangascootack. This line of location is about thirty-three miles in length, and is divided into sections. There are seventeen lift locks, two of them being outlet locks, varying in lift from six to eleven feet. and overcoming a rise of 150 feet.

The board approved of this location, and placed under contract all the sections except the first. This was not placed under contract, because, in the event of an extension of the canal, it will become necessary to erect a feeder dam in the river, below the junction of the West Branch and Sinnemahoning, near the head of section two, where a suitable location can be had. The remaining sections, together with the locks, were placed under contract on the 26th day of July. The culverts, together with some abandoned sections, were let on the 12th of November last.

This extension carries the West Branch division still further into the bituminous coal regions. It is the coal and iron of that region that must be relied on for revenue to pay the interest upon the cost and in time to reimburse the principal. But when extended, if practicable to do so, (and by the report of Mr. Ayerigg it appears practi-

cable upon the plan of constructing reservoirs) so as to form a connexion with our public works west of the Alleghanies', it will be one of the most valuable of our improvements, offering an uninterrupted water communication from east to west.

Estimated cost of completing the Sinnemahoning extension, is	$1,285,867 95
Amount appropriated by the act of 14th of April, 1838, is	100,000 00
Amount required to complete.	$1,185,867 95

ALLEGHENY FEEDER.

The Canal Commissioners were directed by the act of the 14th of April, 1838, to locate and put under contract a navigable feeder, on the west side of the Alleghany river, from a point opposite or near the town of Kittanning to the Pennsylvania canal; the work to be so constructed as not to obstruct the ascending or descending navigation of the Alleghany river. The board directed the location to be made by the erection of a dam in the river near the town of Kittanning, not exceeding four feet in height; to be constructed with a safe schute, and a lock, so as freely to admit of the passage of steamboats. The fall in the feeder to be about one inch to the mile, and the feeder to be of the same dimensions with the Pennsylvania canal. The level below the aqueducts at Freeport, to be sunk to suit the above plan, and a lock to be placed near the aqueduct.

This line is about fourteen miles in length, from the aqueduct at Freeport, to the site of the dam near the town of Kittanning, it is divided into twenty-four sections, which were placed under contract on the 18th of August.

The dam and locks have not been let or placed under contract, the sections being more than sufficient to exhaust the present appropriation.

There has not been much progress made in the work thus far, but the force is increasing and it is expected the appropriation will be exhausted early in the winter. This improvement connects the town of Kittanning with the public works at Freeport. It will be useful to the citizens of Armstrong county, furnishing them a more ready communication to market. It will also be useful as a feeder to the canal from Freeport to Pittsburg, and will, when the canal is extended to the West Branch, form a part of the main line of that communication and lose its character as a local work, and its name of feeder.

For a more particular description of the feeder, and also of the Sinnemahoning extension, the board would refer to the report of the engineer, B. Acrigg, who has charge of these improvements.

Estimated cost of the Allegheny feeder,	$662,603 75
Amount appropriated by the act 14th April 1838, is	30,000 00
Amount required to complete is	$632,603 75

WISCONISCO CANAL.

This canal extends from the slack water of the Clark's Ferry dam, near Duncan's Island bridge to the Wisconisco creek, where it terminates in the pool of a dam to be erected on the Wisconisco, at which place it connects with the Lykens Valley rail road, and is twelve and a half miles in length.

The Wisconisco creek will not be sufficient to feed the canal in dry seasons of the year. A feeder can be taken out of the Susquehanna at Walters' mill, two and a half miles above Millersburg, where there is a fall in the river of seven feet. The location has been made with a view of ultimately feeding the canal from the Susquehanna river at a point near Walters' mill. This canal was divided into twenty-five sections and placed under contract on the 8th of August. There are six locks, one dam, three aqueducts, desides the necessary farm bridges. The work has progressed rapidly, and the funds appropriated were exhausted early in the month of October. This canal will be a complete work within itself—commencing as it does at the source whence it will derive its revenues. Lykens Valley abounds in coal. Canals leading into the coal regions have always proved profitable. This canal will be among the most profitable of the State improvements. Independent of the prospect of a large revenue from tonnage on its own waters, it will proportionably increase the revenues on the main line. The construction of the feeder from Walters' mill should be authorized to be placed under contract, and the canal and feeder completed as early as practicable.

Estimated cost of the canal including the feeder, which is estimated at $26,596 is	$303,761 03
Amount appropriated by act of April, 14th, 1838,	20,000 00
Amount required to complete is	$283 761 03

SURVEYS.

The act of the 14th of April, 1838, authorized the Canal Commissioners to have a survey made by competent engineers, of a route for a continuous rail road from Chambersburg to Pittsburg, without inclined planes, or for a McAdamized road and rail road in connection. They were also required to have a survey made of the Raystown branch of the Juniata for canal, rail road, or slackwater navigation, so as to connect the coal and iron region of Bedford county, with the public works.

The board appointed Hother Hage, Esq. to discharge this duty, with instructions to detail at least two corps of engineers for that purpose, and at the solicitation of citizens of Westmoreland county,

uthorized the formation of a third, with a view of having the surveys completed this season.

The survey has been so far completed as to enable the engineer to report, that a continuous rail road may be made without inclined planes from Chambersburg to Pittsburg. The distance by the route surveyed is 243 miles, and is thus described "commencing at Chambersburg, passes through Cumberland Valley, crossing the West Branch of Conococheague creek, some distance below Loudon; thence ascending the side of Cove mountain it reaches Cowan's Gap, and descending the waters of Aughwick creek by the burnt cabins, to Sideling Hill run, it turns up that stream. Passing through Wells' Valley it meets Ray's Hill, where a tunnel will be unavoidable. By these means the waters of the Raystown branch of the Juniata are attained. When the route passes through Groundhog Valley, and crosses the Juniata branch near Piper's run, when it ascends into Woodcock Valley, whereby a near cut is effected to Bloody run, at the village of this name the line again meets the ravine of the Juniata, and passing the town of Bedford continues to ascend along the river bank until Buffaloe mountain is attained. Crossing from Buffaloe mountain to Dry Ridge, a spur of the Alleghany mountain is reached; and by ascending along the slope leading to Deeter's run, it crosses that stream, meeting the main ridge of the Alleghany at a favourable place for the second tunnel. After penetrating through the mountain, the line takes a southardly turn towards Berlin, thence sweeping to the west it passes about three miles north of the town of Somerset, and pursuing the dividing ground between the waters of Connemaugh and Castleman's river it meets the base of Laurel hill. From this point a very circuitous route takes the line to Laughlinstown, and descending along the valley of Loyalhanna it passes Ligonier; thence after passing through the Gap, in the Chesnut ridge, it leaves this creek near the mouth of Fourteen mile run. Having ascended the valley of this stream the line was conducted by the sources of the Crab Tree run to the waters of Sewickley creek, and thence near Greensburg to the waters of Brush creek. By descending this stream and Turtle creek it meets the Monongahela river, and by its bank finally reaches Pittsburg."

The distance of this route over the present turnpike is about 90 miles, winding as it does among the mountain passes. The tunnels will each be about 2500 feet in length, the highest grade about 60 feet to the mile. A further report of the graduations of the road, with a profile and an estimate of the cost, will be furnished by the engineer, and laid before the legislature. No survey has been made of a McAdamised road, and rail road in connexion.

The cost of a continuous rail road will be large, from the increased distance over the present turnpike. The cost of a McAdamized road would be so much less than the rail road that it becomes an important question which mode of improvement would be the most beneficial. Economy in the construction, saving in distance, and the facility of keeping open the road in the winter months are all in favor of a McAdamized road. Saving of time, avoiding all transhipments,

economy in the price of transhipment are all in favor of the rail road. The relative merit of the two plans can be best determined by accurate surveys and estimates.

The board would recommend a more thorough examination of the route of the continuous rail road, and a survey and estimate of McAdamizing the present turnpike road, reducing the grades wherever practicable, or the survey and estimate of a McAdamized road and rail road in a connexion. In making a survey of the Raystown branch, with reference to connecting the coal and iron region of Bedford county with the Pennsylvania canal, it was found upon examination that this branch of the Juniata river washes the base of what may be termed the coal region, from the mouth of Yellow creek, at Hopewell iron works, to the out-let of Trough creek, a distance of 29 miles 56 chains. The latter stream empties into the Raystown branch of the Juniata, about 24½ miles from the Pennsylvania canal, making a total length of navigation of 54 miles and 15 chains.

The mode of improvement adopted is that of slack water navigation, at least 23 dams must be constructed, and 266.25 feet of lockage overcome. Favorable sites for the dams can be obtained, and their height so regulated that but little land will be inundated. An estimate of the cost of this improvement will be furnished by the engineer, and transmitted to the legislature.

The survey authorized to be made by the act of the 14th of April, 1838, to avoid the Schuylkill inclined plane is now in progress by J. D. Harris, whose report on that subject will, when made, be transmitted to the legislature.

WATER POWER.

By a resolution of the 17th of April, 1838, the Canal Commissioners were authorized to purchase on behalf and in the name of the commonwealth, such land upon which there is any useful water power created by the public works, as they may deem necessary for the beneficial use of said water power.

The board have seen but few situations on our public works where the water could be spared for manufacturing purposes, without injury to the navigation. On most of the lines of improvement there are locations where the water might be employed for a portion of the year. There are two sites on the Juniata river, one at Auckwick dam, the other at the dam below the Raystown branch, where the water could be employed nearly the whole year. At the different dams on the Beaver division the surplus water may be employed. At most of these dams the owners of the land claim the surplus water, by virtue of their improvements, made under the act of 1803. These lands are valued high, and the owners for the most part are unwilling to sell.

Surplus water may be spared for a portion of the year at some of the dams on the French creek, and the North and West branches of the Susquehanna; and on the Western division.

The whole surplus water may be employed on the North branch, at the dams at Athens and Towanda. In compromising claims for damages the board have purchased a sufficient quantity of land at each of these locations to ensure the beneficial use of the water power. They have not been able to purchase land at any of the other locations.

DAMAGES.

The attention of the board has been particularly directed to this subject. Applications for damages had been accumulated for years —some of them remaing on file since 1833, and most of them small in amount. The board have examined these claims, inspected the premises, and awarded the damages.

Few applications, if any, for damages on the *old lines* of canal remain unsettled.

As the extensions become finished the claims for damages will increase, and applications become more numerous. The amount of the damage fund will therefore require to be enlarged. A statement of the amount of damages awarded during the past year is appended to the report, and amounts to $47,479,12.

REPAIRS.

The amount appropriated to ordinary repairs of $280,000 had been anticipated by the heavy expenditures made during the winter and spring; and at the time the *breach* occurred above Huntingdon was nearly exhausted.

The statement annexed to this report will exhibit the amount expended on the different divisions during the fiscal year amounting in the aggregate to $281,911,55 drawn from the Treasury.

CLAIMS.

The board have attended to the settlement of all, or nearly all of the claims referred to them by the resolutions and acts of the last legislature. The aggregate amount awarded is $9,560 50.

TOLLS.

At the period of making the last annual report, the revenues from tolls were estimated at $1,200,000, for the present year, and the hope expressed that it would reach $1,400,000 if the causes which had been operating to check the commerce and paralize the industry of country were removed. The amount of estimate has not been realized. The disastrous breach in the canal above Huntingdon suspending the navigation on that portion of our public work for upwards of five months; the long and severe draught of the season, affecting all or nearly all of our lines of improvements; the uncertainty of the breach being repaired in time for the fall business, and

and the consequent diversion of a portion of trade to other routes in other states; and the low stage of water in the Ohio river preventing western products from reaching our eastern market, have been the principal causes of the deficiency. But for these, the estimates would have been greatly exceeded, and in all probability the tolls would have amounted to $1,500,000, a sum equal to the interest upon the state debt, and the ordinary appropriations for repairs.

Notwithstanding these disadvantages there has been collected for tolls:

Canal tolls,	$430,002 17
Rail way,	321,542 01
Motive power,	239,708 24
Whole amount,	$991,242 42
Exceeding the receipts of last year,	$15,001 98
And falling short of the estimate,	208,747 58

From the aspect which the monetary affairs of the country have assumed since the resumption of specie payments, and the prospect of a revival of business, (if no extraneous action take place to interfere with and blast the reviving hopes of the country,) we may fairly estimate the amount of revenue to be derived from tolls, for the present year, at $1,500,000, with a prospect of reaching $1,600,000.

The amount of tolls received on the Philadelphia and Columbia rail road, during the fiscal year equals six per cent on the original cost after paying all expenses, and if we add the excess of the motive power fund near seven per cent. It will no doubt yield next year ten per cent.

We may reasonably calculate upon a regular and gradual increase of revenue from tolls, year after year, until the result will astonish the most sanguine advocates of our system of improvements. Although the revenue to be derived from tolls received on the main line shall have been attained, and new avenues opened up, and they in their turn filled, yet our greatest revenues and largest receipts of tolls will be upon those lines of canal upon which coal and iron are carried.

When our lines of canal now projected shall have been completed and extended. When a continuous rail way shall have been made to Pittsburg, and a continuous water communication to the Ohio and the Lakes, we shall have more than 1100 miles of canal and 400 miles of rail road.

It may be considered visionary. It would be tedious to encumber this report with a detailed statement of the date on which the result is founded; but it is a moderate calculation to say, that in less than ten years from their completion, the tolls on freight on the canals (exclusive of coals,) would not be less than $2,000,000 per annum. The toll charged on passengers on the rail road is one cent per mile and two cents per mile on the cars. Within the time above men

tioned, when Philadelphia shall be joined to Pittsburg, by a continuous rail road, free from inclined planes, which will be travelled from end to end in less than thirty hours, it is certainly not extravagant to estimate the number of passengers at 800 per day. The toll on these, (exclusive of cars and motive power) supposing the road to be 400 miles long, would be $3,200 per day or $1,168,000 per annum.—Add the toll on thirty cars at two cents per mile each, being $87,600 per year. The tolls on merchandize, and other freights carried on the continuous and portage rail roads, might be fairly estimated at $1,000,000 more.

But the source of the greatest revenue to the State, will most unquestionably be the Coal trade. The canals of every country leading to coal mines have been found extremely profitable. The value of the stock of the Schuylkill Navigation company, although sold originally with great difficulty, and to bold adventurers only, is now nearly quadruple its original cost. Our Delaware Division is already paying the interest of the cost of construction. They are supported almost exclusively by the tolls on coal. The coal mines of Pennsylvania, both Bituminous and Anthracite, are numerous—scattered over various parts of the state, and altogether inexhaustible. Those on the Lehigh, Schuylkill, Lykens Valley, Mahonoy, Shamokin, and in Huntingdon, Bedford, Cambria, Lycoming and Clearfield counties are well situated to supply the Atlantic cities, and to be borne seaward along the whole coast. Those in the counties on the western side of the Alleghenies, and in Bradford and Luzerne counties, will monopolize the market of Western New York—of the numerous cities which are springing up with inconceivable rapidity on the shores of the great Lakes, and of the vast fertile country which surrounds them. When we consider the rapidly increasing demand for this article, for domestic, manufacturing, navigating and locomotive purposes, we find it difficult to fix limits to the quantity which will be required by our twenty millions of inhabitants, fifteen years hence. The older states having cleared off their timber, will use it almost exclusively for fuel; every steam boat on our inland seas, and rivers, and many on the Atlantic, and every locomotive on our railroads will be driven by it. There can be but little doubt that ten millions of tons of Pennsylvania coal will be taken to market within the time we are considering. But least it should be thought to be extravagant, let it be fixed at one half that amount, which is but little more than the amount now sold in the city of London alone. This will be carried at an average at least 100 miles on our canals. The toll, which is as low now as it ever ought to be, is about six mills per ton per mile—equal to 60 cents per ton for 100 miles. That on 5,000,000 tons would be $3,000,000, beside the toll on boats, which would be about $175,000 more.

If these calculations look extravagant now, they will seem tame, when experience has taken the place of speculation. Let us recapitulate and see the result.

Tolls on freight on 1,100 miles of canal, (exclusive of coal,)	2,000,000 00

Tolls charged on 800 passengers per day on a rail road from Philadelphia to Pittsburg and Wheeling, 400 miles,	1,168,000 00
Tolls on cars,	87,600 00
Toll on freight carried on Philadelphia and Pittsburg and Alleghany portage railway,	1,000,000 00
Toll on 5,000,000 tons of coal carried at an average 100 miles on canal,	3,000,000 00
Add toll on boats,	175,000 00
Total amount,	$7,430,600 00

The cost of superintendence, repairs, and new work on finished lines, when that extended system is in operation, will probably be	1,000,000 00
To which add the interest at five per cent. on $45,000,000, the probable amount to which the State debt may have swelled, upon the completion of the extended system,	2,250,000 00
	$3,250,000 00

Amount of tolls,	7,430,600 00
Agents, repairs, and interests on debt,	3,250,000 00
	$4,180,600 00

Leaves $4,180,600, to be applied annually towards the reduction of the debt and that sum annually increased, as the interest reduced by payment of principal.

OF APPROPRIATIONS.

The board would recommend the following appropriations for the current year, as necessary for the permanent repair and prosperity of the improvements.

Toward the expense of completing twenty-two and a half miles north track of the Philadelphia and Columbia rail road, (whole estimated cost $199,381 66.)	100,000 00
For the completion of the railway to avoid the incline plane at Columbia,	69,000 00
To complete the three locks now under contract on the Eastern division,	16,000 00
To complete the outlet lock at Duncan's island,	6,000 00
For repairing the aqueduct over the Juniata river, near Duncan's island,	14,000 00
For reservoirs on the Eastern and Western sides of the mountain (estimated by S. Welch, Esq. to cost	

$166,980,) three will be required within the present year,	60,000 00
For the repair of Shamokin dam and Middle aqueduct Susquehanna division,	27,387 00
For rebuilding locks and bridges on the North branch division, (estimated to cost $100,000,)	42,000 00
For cribs, &c. on the West branch division (estimated to cost $40,000,) there will be required for extraordinary repairs the present year,	7,000 00
For permanent repairs to the French creek feeder, (estimated at $86,403,) required for the feeder dam and other repairs the present year,	30,000 00
For permanent repairs on the French creek division (estimated at $76,052,) requires for the present year,	30,000 00
For permanent repairs on the Beaver division, (estimated to cost $40,572,) required the present year,	40,000 00
For ropes for Philadelphia and Columbia rail road,	4,000 00
For bridges on Philadelphia and Columbia rail road, and to pay balance on the Valley creek bridge,	4,000 00
For renewing aqueduct on Delaware division,	5,000 00
For new works on finished lines, pay of canal commissioners, appraisers, and engineers not connected with extension,	30,000 00
For damages,	50,000 00
For ordinary repairs—canal and rail roads,	300,000 00
To pay indebtedness for repairs other than the breach,	77,080 77
To pay repairs made at breach above Huntingdon, per report up to the first of December,	320,000 00
To finish the repairs of the breach above Huntingdon,	25,000 00
	$1,256,467 77

The board recommend the following appropriations to the extensions, as necessary for the work under contract, and their early application.

For the Erie extension,	1,200,000 00
North branch,	1,200,000 00
Gettysburg rail road,	600,000 00
Sinnemahoning extension,	300,000 00
Alleghany feeder,	200,000 00
Wisconisco canal,	286,000 00
	$3,786,000 00

The appropriations to the North Branch, Erie extension and Gettysburg Rail Road, to be apportioned by the Canal Commissioners, to

the Superintendents of the different lines, according to the exigencies and progress of the work; and that the Board be authorized to put under contract during the present year, the remainder of the North Branch, and Erie Extensions, and the Gettysburg Rail Road to the Potomac River, at or near Clearspring, to form a connexion with the Baltimore and Ohio Rail Road.

There will be required for the Philadelphia and Columbia, and Allegheny, Portage rail roads, an increase of motive power. The Board would recommend, that the excess of the motive power fund be applied for the purchase of Engines, not to exceed ten in number for the Philadelphia and Columbia rail road and six for the Allegheny and Portage rail road. The funds appropriated to repairs are exhausted

The monies appropriated to the extensions are all expended, with the exception of a small amount on Sinnemahoning extension and Allegheny Feeder.

The Board would therefore respectfully urge an early appropriation to these works, to the fund of repairs, and to repay monies advanced to repair the breach above Huntingdon.

In December 1835. The country was congratulated by the then Executive and Commissioners, on the signal success, which had attended our system of Internal Improvements, "after nine years of unremitting toil and untiring perseverance in the construction and completion of upwards of 600 miles of Canal, and 120 miles of Rail Road." The "timid were told to rest satisfied that the revenue derivable from the Canals and Rail Roads of the Commonwealth, would within a few years pay the interest, and ultimately discharge the principal borrowed for construction. The attention of the Legislature was called to the policy of further extensions of the Public Improvements, with a view to accommodate the growing interest of the Commonwealth. The works considered of primary importance, and which ought to be constructed as soon as practicable, were the North Branch Extension to the New York State Line, and the Extension to Erie, on account of their intrinsic value, and because they constituted a part of the Improvements originally designated as the Pennsylvania System." Other works were recommended to be constructed by the State, among them a Canal from the Conneaut Lake, to the Beaver Division. A canal and slack water navigation from the head of the West Branch division to the Allegheny river. A canal from the Kiskeminetas aqueduct or steamboat navigation on to Franklin. A slack water navigation on the Monongahela. A canal from Pittsburg to connect with the Beaver Division, and thence to connect with the Beaver and Sandy Canal.

At the time referred to, the tolls for the preceeding year amounted to $684,359 77. The amount drawn from the Treasury and expended in repairs $323,379 25, the amount expending and unpaid, estimated at $200,000 more. The amount required for the current year $809,780 94. The amount of State debt $22,229 03. The interest of which was paid by the premium, obtained on loans, by a tax on

real and personal property, equal to $300,000 per annum, and by the excess of income over the ordinary expenditures, which included the revenue from tolls.

The legislature of 1835–36, governed by the enlarged and liberal policy then recommended, having the utmost confidence in our system of internal improvements, and of their beneficial results, authorized the commencement of the North Branch, and Erie extensions, appropriated the amount required for the current year of $809,780 00—authorized the commencement of the Gettysburg rail road, (on our southern border) and a subscription of stock to aid companies engaged in works of improvements of $600,000—repealed the taxes levied on real and personal property, and provided for borrowing at any future period $6,000,000, at four per cent, to complete the works then undertaken.

The same policy has been pursued by subsequent legislatures, and the system enlarged by authorizing the extension of the West Branch division, and the construction of the Allegheny feeder, and Wisconisco canal. Within the last three years there has been appropriated, and applied to works of internal improvements upwards of $4,000,000.

The present board of commissioners, always the advocates of a liberal system of improvement, fully impressed with its benefits, and confident in its results, have asked for liberal and necessary appropriations, toward completing the works now in progress with the least delay, with reference to their value and importance, with a due regard to the demand for labour, for provision, the state of the money market, and the ability of the commonwealth to provide the means.

The energies of the state should for the present be applied to the early completion of the works now projected, with a view of bringing them into active operation. The North Branch extension, the Erie extension, and Gettysburg rail road, should be finished within the next two years. The Wisconisco canal within the next season, and the Allegheny feeder, and Sinnemahoning extension gradually but steadily.

Upon the completion of the first named works, as the revenues to be derived from tolls increased, as increase they will, when the coal and iron business come to be developed and extended; other improvements should be extended into the hitherto neglected portions of the commonwealth, at whose common risk, and upon whose common credit the improvements have been constructed. Among these would be,

1st. A continuous rail road to Pittsburg, either from the termination of the Cumberland Valley rail road, or the Philadelphia and Columbia rail road.

2nd. The North Branch canal, connected with the Chemung and Chenango canals of New York.

3d. The West Branch canal, completed to Lake Erie and Pittsburg.

4th. The canal extended from Pittsburg to Beaver.

5th. The Wisconisco Canal, extending to the neighborhood of the Mahonoy and Shamokin coal region.

6th. A Canal (or Railroad) up the Raystown branch of the Juniata into the bituminous coal fields of Huntingdon and Bedford counties.

7th. The turnpike road from Chambersburg to Pittsburg should be McAdamized, (especially if a rail road should be deemed inexpedient.)

8th. The inclined plane at schuylkill should be avoided.

9th. The purchase of the Canal to tide—which should be owned by the state.

These would only be finishing the works already begun with their necessary appendages.

The march of Pennsylvania must be onward, her hand upon the plough, she ought not to look back. The system must be pushed on to completion, in order to relieve her from the burthens already assumed. Nor could she have stood still at the onset without losing her relative rank among surrounding states. While they were opening numerous avenues from the Atlantic board to the great lakes, and the Western rivers, had sho neglected to follow their example, her lands and property of every kind would have sunk in value; her trade would have been annihilated, and industry paralized; her agriculture and mineral products shut out from market, and her weight and influence in the nation greatly impaired. Great as was the undertaking, it was wise to begin it; much as yet remains to be done, it would be folly and short sighted parsimony to arrest it.

Pennsylvania has entered into competition with her generous rivals, Maryland on the south, New York on the north, for the trade of the great West. She must contend manfully, generously, but with a spirit of state pride worthy of the Key-Stone State, and her mighty resources. Maryland has brought hers to the aid of individual enterprize, in extending the Chesapeake and Ohio Canal to Cumberland; and the Baltimore and Ohio Rail road, to the Ohio river at Wheeling. New York is engaged in enlarging and deepening her main line of canal, at an expense of fifteen millions.

Pennsylvania, in addition to her present works, must open up two other great avenues to the west—one a continued water communication—the other a continuous railway without inclined planes. Then she will have placed herself in an attitude to view the exertions of her sister states without apprehension. Then will she have won the prize for which she has been so nobly contending; and then she will have overcome not only the barriers of nature, but the more formidable obstacles of prejudice and incredulity.

Sighed by order of the Board.

JOHN DICKEY,
President.

ATTEST:—W. C. M'PHERSON, *Secretary.*

STATEMENT of the amount drawn from the Treasury for the (ordinary) repairs of Canals and Railways, during the year ending October 31st, 1838:

Philadelphia and Columbia Rail Road,		82 miles	$30,500 00
Allegheny and Portage Rail Road,		36 "	35,850 47
Eeastern Division,	$29,930 09	"	
Juniata Division,	30,880 44	172 "	60,810 53
Western Division,		105 "	57,404 75
Delaware Division,		59¾ "	38,095 00
Susquehanna Division,		39 "	11,595 00
North Branch Division,	$12,198 42	"	
West Branch Division,	27,225 29	145¼ "	39,423 71
Beaver Division,		31 "	2,500 00
French Creek Division,		22¼ "	5,732 00
			$281,911 55

The amount of indebtedness for repairs on the different divisions, as ascertained by the reports of the supervisors, amount to $77,080 97

STATEMNNT shewing the amount of indebtedness upon the several divisions of the Pennsylvania Canal and Railway for ordinary repairs, up to the 31st October, 1838:

Philadelphia and Columbia Railway,	$13,533 23
Allegheny Portage Railway,	9,374 54
Eastern Division,	8,168 23
Juniata Division,	3,715 42
Western Division,	8,569 24
Delaware Division,	22,052 50
Susquehanna Division,	1,957 52
North Branch Division,	446 29
West Branch Division,	9,264 00
	$77,080 97

STATEMENT of the amount drawn from the Treasury, and applied to the payment of damages during the year ending October 31st, 1838:

Philadelphia and Columbia Rail Road,	$8,000 00
Road to avoid Columbia Plane,	1,200 00
Eastern Division,	7,740 62
Juniata Division,	4,300 00
Western Division,	5,085 00
Delaware Division,	4,000 00
Susquehanna Division,	1,500 00
North Branch Division,	2,393 00
West Branch Division,	5,273 50
Beaver Division,	525 00
French Creek Division,	2,080 00
North Branch Division, (Tioga Line,)	5,380 00
	$47,479 12

LIST of claimants, together with the amount of claims for damages on the French Creek division of the Pennsylvania canal, referred to in the report of the Canal Commissioners:

Finlow Beatty,	crops and land,	3,158 00
Elisha Wightman,	do	811 75
Artimus Smith,	do	76 00
Thomas Powell,	crops and land,	2,059 00
John Wentworth,	do	255 00
John Wentworth, Jr.	land,	875 00
John Crosby,	crops,	396 50
Daniel Smith,	crops and land,	1,115 00
Henry Marleys,	land,	1,000 00
Jonathan Witzell,	crops,	285 00
Increase Smith,	do	730 00
George Millard,	land,	750 00
Nathan F. Randolph,	crops,	597 00
Mary Harts,	land,	120 00
James J. Marley	do	310 00
James Mumford,	crops and land,	1,680 00
A. W. Mumford,	do do	390 00
James Scroggs,	crops,	436 00
Abraham Dean,	crops and land,	1,495 00
J. T. & C. M'Clelland,	crops,	208 40
Taylor T. Randolph,	crops, &c.	1,328 00
Alexander Shaw,	do	2,081 00
Philip Hart,	land,	375 00
Alpheus Smith,	crops and land,	1,353 00
David Compton,	land,	1,150 00
		$22,834 65

Showing the amo

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David Compton,	land,	1,150 00
		$22,834 65

Showing the amo… taken off at Easton, Be… mission…

ARTICLES.		Bristol northward.	Intermediate offices, Northward.	Taken off at Easton.	Taken off at Berwick.	Taken off at Dun town.
Flour,	barrels	5,907	307	67	838	
Wheat,	bushels	20,032	822	14,509	463	
Corn and other grain,	do.	7,956	25,253	10,814	29,575½	
Clover and other grass seeds,	do.	2,050	21	1,500	21½	
Potatoes,		83	1,614	2,155	2,246	
Salted beef,	barrels	3,089	600	264	12	
do. pork,	do.	350	860	476	357	3,572
Bacon,	pounds	265,029	61,726	256,952	5,123	907
Fish,	barrels	5,575	1,822	6,248	1,324	
Butter and Cheese,	pounds	11,594	2,600	10,456	1,415	
Lard and Tallow,	do.	24,207	560	21,348		
Salt,	bushels	45,408	10,430	49,615	1,264	2,262
Provisions not specified.	pounds			16,055		
Feathers,	do.					
Wool,	do.	42,010		46,110		
Cotton,	do.	146,047		147,795		
Hemp,	do.	24,129	2,175	24,129	2,389	
Tobacco,	do.	212,113	1,550	217,804	1,844	
Leather,	do.	5,292	68,098	1,112		
Raw hides,	do.	579,944		514,166	34,872	6,547
Furs and peltry,	do.		6,644			
Whiskey and domestic spirits,	gallons	12,915		5,783	17,030	
Merchandize,	pounds	2,523,295	2,378,093	2,002,261	1,860,316	858,947
Groceries,	do.	3,586,386	867,508	3,229,284	888,420	84,705
Oil,	gallons	21,717		19,702	383	
Drugs and Dye-stuffs.	pounds	288,489		328,889		
Gypsum,	tons	2,338	751	1,424	9	248
Furniture,	pounds	118,052	57,422	94,342	29,666	7,583
Window glass,	boxes	351	30	125	940	
Rags,	pounds	3,647				
Mineral coal,	tons	1,687	2,715	823	642½	51
Iron ore,	do.		4,414		1,317	1,824
do. Pigs and castings,	pounds	437,144	429,162	159,895	301,639	263,380
do. Bloom, bar and sheet,	do.	1,588,908	445,367	1,486,734	184,053	126,087
Lead in pigs and bars				1,011		
Copper and tin,	do.			40,279		
Marble,	do.	61,514	23,330	62,414	600	
Lime,	bushels	9,065		958	2,843	
Limestone,	perches				355	
Slate for roofing,	pounds				905	
Bricks,	number	31,112	55,171	11,200	50,253	
Timber,	feet				618	
Sawed lumber,	do.	103,670	20,421	20,984	155,867	
Staves, heading and hoop poles,	pounds	82,060		140,094		
Shingles,	number	320,943	4,900		25,000	
Posts and rails,	do.	2,600				
Sundries,	pounds	5,861,263	288,908	1,614,133	408,984	104,468
Number of boats and rafts cleared,		3,574	1,843	3,112	799	141
Passengers, miles travelled,		454,443	770,125		5,746	
Amount of tolls receiv…						

ENGINEER'S OFFICE,
Columbia Nov. 6th, 1838.

To the Board of Canal Commissioners,

GENTLEMEN:—I have the honor respectfully to present to the board my third annual report:

The break above Huntingdon is nearly repaired; I passed over the line ten days ago, it was then nearly in a condition to admit of full levels the whole extent, except at Spang's aqueduct. This work was behind hand, but it was thought that by applying as great a force as could work at it, it would be in readiness to receive the water the last of this week. These repairs have been completed in a shorter period of time than could reasonably have been looked for. Few who passed over the ground immediately after the work of destruction had been effected, looked for its completion much earlier than next spring. The floods swept over it without mercy; and the canal for many hours was hid from view. The board were eye witnesses of the scene, and saw the desolation after the floods passed away. My description therefore may be brief. The canal was laid too low. Had the great pumpkin flood as it is called, been taken for a guide, for its location the canal would have escaped damage. Its construction also was imperfect, particularly the locks and dams. In the repairs the dams have been lengthened where it could be done, and locks and abutments of the dams more substantially built. The lock walls have been carried up full thickness from bottom to top, and the iron bars which clamp the lining of the locks to the sides, extend through the wall and fasten on the back of it. In this manner they not only secure the lining firmly to its place but assist to bind the wall together. Twelve locks may be said to have been rebuilt entire.—Part of the walls of a few of them towards the foundations answered to build on, but the labor required to clear off so as to get at the work, amounted to an entire rebuilding. And seven other locks required repairs more or less. Two large aqueducts across the Juniata have been renewed with their piers, four towing path bridges across the river, six dams underwent heavy repairs, and four others more or less injured. At the first dam above Huntingdon the abutment of the dam was entirely carried off and a hole sixteen feet deep washed out where the abutment and the embankment between the abutment and lock stood. This breach has been repaired by sinking a crib sixty feet long and the breadth as the base of the former dam raising it te a corresponding height and sheeting it in the same manner. This gives an additional length of sixty feet to the water way.

A new abutment has been built, extending down to the lower end of the Guard Lock. The repairs done to this lock, amount to a rebuilding. The walls had in a great measure to be taken down, the Canal break for half a mile below, was chiefly destroyed—the repairs on this

portion of the line were heavy—extending the length of the dam, rebuilding the lock and abutment, and repairing the canal bank below. At the 2d dam above Huntingdon, the river broke round the Western abutment, and carried away about 80 feet of the embankment, building it with the bed of the river, and carrying down the abutment.—The water also broke over the embankment at the Eastern end, but with less damage—it carried off 8 feet of the top, down to the natural soil. The Lock was not much injured, and the abutment was left standing. The Canal bank below for quarter of a mile was damaged.—The repairs at this dam were not so great by any means as at the one below. The cribbing however is undermined, and the stones washed out, and it will probably require some additional repairs during next summer. The canal bank from this place to Petersburg was more or less injured, and the tow path bridge across the river, carried away. The Lock at the Petersbnrg Dam, required some repairs, and the weight of water raised the crib work of the dam on the lower side. The sheeting had to be taken off and the cribs replaced—The repairs here were not heavy, the flat is wide and the water had room to spread, the canal from this point, to the aqueduct below Alexandria being out of reach, except along the slack water of the Petersburg dam escaped damage. The heavy aqueduct below Alexandria, was carried off and with it the stone piers. The whole has been substantially rebuilt. Owing to the scarcity of suitable timbers in the neighborhood, it was found best with the approval of the Board, to frame this aqueduct, and the one at Spang's, at Duncan's Island.—From the aqueduct below Alexandria, to a little below water street dam, the canal escaped; being out of reach. The guard lock and abutment of the water street dam, were destroyed.

The lock and abutment have been rebuilt, and the wooden wier of the dam extended as at the Huntingdon dam, 76 feet. The canal bank below for some distance injured, and the embankment at the south end of the turnpike bridge across the canal at this point carried away. The tow path along the slack water of the Water Street dam was under water, and towards the upper end damaged and broken up. At the first dam above Water Street the guard lock and abutment both went, and the rubbish from them and the canal banks below, filled up the next lock. The repairs it required amounted to rebuilding. One side and part of the other were taken down. 500 feet of canal, between this lock and the guard lock, was erased, and no signs of a canal left. The mountains close in upon the river at this point. The guard lock sits against the hill, and the dam could not be lengthened. The sheeting on the lower side of the dam from end to end was ripped off by the freshet. It has been replaced, and the abutment and lock rebuilt. The towing path, from this dam upwards, is more or less badly torn. The guard lock and dam first below Spang's, stood without much injury. The lower end of the abutment and part of one side of the lock went, and the lock required some relining. The tow path round the slack water of this dam being of light soil melted away under the heavy rush of water, and

	mediate offices, mberland, New- tc. south.	Taken off at Bristol.
	23,489	75,981
Fl	141,396	50
W	65,693	54,262
Co	4,813	64
Cl	6,297	1,020
Po		
Sa	4,274	63
	2,492	1,763
Ba	1	7
Fi	164,860	33,441
Bu	6,024	6,024
La		
Sa		
Pr		
Fe		
W		3,766
Co	113,386	63,906
He	16,768	4,840
To	95,377	220,842
Le		
Ra		
Fu	164,789	352,650
W	8,402	315,398
Me		2,708
Gr	13,302	44,528
Oil		
Dr	2	
Gy	50,143	84,988
Fu		
Wi	51,817	86,949
Ra	10,477	170,776
Mi		1,236
Iro	1.788,147	1,181,591
	283 500	1.353,668

cted the

portion of the line were heavy—extending the length of the dam, rebuilding the lock and abutment, and repairing the canal bank below. At the 2d dam above Huntingdon, the river broke round the Western abutment, and carried away about 80 feet of the embankment, building it with the bed of the river, and carrying down the abutment.—The water also broke over the embankment at the Eastern end, but with less damage—it carried off 8 feet of the top, down to the natural soil. The Lock was not much injured, and the abutment was left standing. The Canal bank below for quarter of a mile was damaged.—The repairs at this dam were not so great by any means as at the one below. The cribbing however is undermined, and the stones washed out, and it will probably require some additional repairs during next summer. The canal bank from this place to Petersburg was more or less injured, and the tow path bridge across the river, carried away. The Lock at the Petersburg Dam, required some repairs, and the weight of water raised the crib work of the dam on the lower side. The sheeting had to be taken off and the cribs replaced—The repairs here were not heavy, the flat is wide and the water had room to spread, the canal from this point, to the aqueduct below Alexandria being out of reach, except along the slack water of the Petersburg dam escaped damage. The heavy aqueduct below Alexandria, was carried off and with it the stone piers. The whole has been substantially rebuilt. Owing to the scarcity of suitable timbers in the neighborhood, it was found best with the approval of the Board, to frame this aqueduct, and the one at Spang's, at Duncan's Island.—From the aqueduct below Alexandria, to a little below water street dam, the canal escaped; being out of reach. The guard lock and abutment of the water street dam, were destroyed.

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Showing the amount of property shipped southward from Easton, Berwick, Dunnstown and intermediate offices; also the amount taken off at Bristol.

ARTICLES.		Easton south.	Berwick south.	Dunnstown south.	Intermediate offices, Northumbarland, Newhope, &c. south.	Taken off at Bristol.
Flour,	barrels	69,827	339	209	23,489	75,981
Wheat,	bushels	8,387	17	31,447	141,396	50
Corn and other grain,	do.	44,401	410	2,966	65,693	54,263
Clover and other grass seeds,	do.	27	122½	224	4,813	64
Potatoes,	do.	639	5,633		6,297	1,026
Salted beef,	barrels					
do. Pork,	do.	12			4,274	63
Bacon,	pounds	763			2,492	1,763
Fish,	barrels		11		1	7
Butter and Cheese,	pounds	36,500	34,696		164,860	33,441
Lard and Tallow,	do.		250		6,024	6,024
Salt,	bushels		1,451			
Provisions not specified,	pounds					
Feathers,	do.					
Wool,	do.					
Cotton.	do.	3,765				3,766
Hemp,	do.				113,386	63,906
Tobacco,	do.		994		16,768	4,840
Leather,	do.	236,830	8,731	3,250	95,377	220,842
Raw Hides,	do.					
Furs and Peltry,	do.		506			
Whiskey and domestic spirits,	gallons	267 213	715	926	164,789	352,650
Merchandize,	pounds			5,503	8,402	315,398
Groceries,	do.	4,160	300			2,708
Oil,	gallons	32 614			13,302	44,528
Drugs and dye stuffs,	pounds					
Gypsum,	tons		39½		2	
Furniture,	pounds	66,166	25,000		50,143	84,988
Window glass,	boxes					
Rags,	pounds	100,023	3,350	2,000	51,817	86,949
Mineral coal,	tons	155,720	12,008¼	1,360	10,477	170,776
Iron ore,	do.	1,583		323		1,236
do. Pigs and castings,	pounds	2,519,282	31,524	3,218,320	1.788,147	1,181,591
do. Bloom, bar and sheet,	do.	113,307	8,190	1,094,504	283,500	1,353,668
Lead in pigs and bars,	do.					
Copper and tin,	do.					
Marble,	do.					3,360
Lime,	bushels				173,140	70,800
Limestone,	perches	20		34	1,417	
Slate for roofing	pounds	474,608		56,672		474,600
Bricks,	number			8,884		
Timber,	feet		13,771	40,722	3,952	3,840
Sawed lumber,	do.	1,904,316	227,856		798,566	2,445,947
Staves, heading and hoop poles,	pounds		129,800		408,710	
Shingles,	number	183,000	171,500		210,000	193,600
Posts and rails,	do.		1,500		1,240	1,100
Sundries,	pounds	4,146,605	754,665	1,395,523	17,635,261	19,161,432
Number of boats and cars cleared,		3,106	734	267	2,235	3,276
Passengers, miles travelled,		3,656	192		771,120	17,635.
Amount of tolls received,						

from Philadelphia, Portsmouth, Hollidaysburg, erty taken off at Pittsburg.

g, West.	Johnstown, West.	Intermediate offices, West.	Taken off at Pittsburg.
43		313	
130		1,322	
,518		68,609	1,933
146½		124	
	53	6,980	3,789
		128	
3		3	991
		15,592	
,667	8,095	2,631	7,294
,379	3,537	7,157	111,325
950½	3,387	3,708	140,935
		344,125	
,741	41,009	334	
		1,533	
,370	417,632	2,813	392,132
,011	27,506	65,354	66,669
,852	278,342	22,012	212,420
,717	121,945	72,293	
,481		70	
,666	5,970	51,389	70,623
,457	23,702,270	1,215,726	14,932,410
,004	10,036,291	400,205	7,456,634
,247	72,730	9,158	76,381
,508	281,560	208	230,244
63¾	58	705	22
,833	2,008,359	460,006	1,691,137
2	29	20	

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The following Table shows the amount of property shipped Westward from Philadelphia, Portsmouth, Hollidaysburg, Johnstown and intermediate offices; Also, the property taken off at Pittsburg.

ARTICLES.		Philadelphia, West.	Portsmouth, West.	Hollidaysburg, West.	Johnstown, West.	Intermediate offices West.	Taken off at Pittsburg.
Flour,	bsrrels	2,818	165	43		313	
Wheat,	bushels	5,658¼	755	130		1,322	
Corn and other grain,	do.		4,920	2,518		68,600	1,933
Clover and other grass seeds,	do.	146½		146¼		124	
Potatoes,	do.	3,503½	1,894		53	6,980	3,789
Salted beef,	barrels	6½	2			128	
do. pork,	do.		137	3		3	991
Bacon,	pounds	91,560	147,104			15,592	
Fish,	barrels	13,123½	13,410	4,067	8,095	2,631	7,291
Butter and cheese,	pounds	63,399	500	75,379	3,537	7,157	111,325
Lard and tallow,	do.						
Salt,	bushels	71,003¼	68,805	950¼	3,387	3,708	140,935
Provisions not specified,	pounds	38,426	340,156			344,125	
Feathers,	do.	6,058					
Wool,	do.	191,327		69,741	41,009	334	
Cotton,	do.	295,543	6,177			1,533	
Hemp,	do.	485,523	157,788	513,370	417,632	2,813	302,132
Tobacco,	do.	1'0,732	22,909	121,011	27,506	65,354	66,669
Leather,	do.	583,210	63,612	423,852	278,342	22,012	212,420
Raw hides,	do.	536,711	665,326	153,717	121,945	72,293	
Furs and peltry,	do.			3,481		70	
Whiskey and domestic spirits,	gallons	14,892	1,870	93,666	5,970	51,389	70,623
Merchandize,	pounds	22,183,190	11,040,317	19,818,457	23,702,270	1,215,726	14,932,410
Groceries,	do.	21,076,722	10,206,612	12,512,004	10,036,291	400,205	7,456,634
Oil,	gallons	72,723½	21,808	58,247	72,730	9,158	76,381
Drugs and Dye-stuffs,	pounds	98,019	174,514	1,070,508	281,560	208	230,244
Gypsum,	tons	3,513	6,610	63¾	58	705	22
Furniture,	pounds	2,330,379	245,334	1,786,833	2,008,359	460,000	1,691,137
Window glass,	boxes	79¼	15	2	29	20	
Rags,	pounds	434,798				3,972	
Mineral coal,	tons	948,180	766		13	1,002	1,001
Iron ore,	do.		55			8,016	
do. Pigs and castings,	pounds	302,667	210,718	114,852	949,423	2,087,090	1,103,312
do. Bloom, bar and sheet,	do.	689,130	2,473,144	22,018,523	23,882,332	879,749	15,172,607
Lead in pigs and bars,	do.	51,'69		52,123		26 335	12,195
Copper and tin,	do.	365,923	103,627	551,824	363,942	1,181	493,102
Marble,	do.	637,643	135,038	654,520	458,570	4,830	1,385,608
Lime,	bushels	631		105	178	425	
Limestone,	perches		51			525	
Slate for roofing,	pounds						3,500
Bricks,	number	289,881	11,050	2,500	2,620	29,969	
Timber,	feet			2,818		4,863	
Sawed lumber,	do.	178,104	945,351	332,523	24,008	120,115	
Staves, heading and hoop poles,	pounds	29,170	230,604			93,810	244,680
Shingles,	number	9,800	114,203	6,000		35,403	5,250
Posts and rails,	do.				567	3,125	6,900
Sundries,	pounds	6,669,303	5,733,055	2,574,234	2,149,320	660,550	2,716,155
Number of boats and cars cleared,		26,817	2,788	17,652	2,127	12,520	
Passengers, miles travelled,		2,250,568	15,340	761,001		3,300,521	
Amount of tolls received,		$251,510 49		$89,631 21			

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was much injured. The tow path bridge at the head of the pool of this dam went, and is rebuilt, with the piers. The heavy aqueduct at Spang's, with the piers, went down. By Thursday next, I understand, this work will be ready for the water, and then the navigation will be complete through. The guard lock and abutment with the lock house and ¼ mile of canal below, at the dam next above Spang's all disappeared, and there was nothing left scarcely to mark where they stood. The new lock stands out farther from the river, on a foundation excavated for it by the flood, and the wier of the dam is lengthened 40 feet, and a substantial new abutment built. The guard lock and abutment at Schmoker's were torn down by the freshet, and are rebuilt. The guard lock at the dam next above Schmoker's, is rebuilt entire, and the abutment partly rebuilt. The outlet lock into the pool of this dam, and the tow path bridge across the head of the pool and its piers were rebuilt entire. Between this and Williamsburg the locks were not injured, but about one mile of towing path was broken up and carried off, and the lock house at the first lock below the town went down. The dam above Williamsburg has been lengthened about 40 feet, a new abutment built, and the guard lock partly rebuilt, and the tow path bridge across the pool immediately above and two piers rebuilt. The tow path along this pool broken up and injured. The dam at Royer's, or Franklin forge dam, required heavy repairs. The water broke over the embankment between the guard lock and the dam, 400 feet in length, and razed it down level with the bed of the river, and formed for itself a new channel. The guard and lift locks were injured so as to require chiefly to be rebuilt, and the embankment of the canal for ¼ mile below erased. The wier of the dam has been extended 200 feet. The old wier being also 200 feet, the water way is now 400 feet long. The breaking of this dam added to the mischief done below, by increasing the volume of water and prolonging the flood. The pool of this dam is 3 miles long. The canal from this point to Hollidaysburg was comparatively not much damaged, and was soon put in navigable order. The feeder aqueduct below Hollidaysburg went down. The Portage rail way between the weigh scales and the aqueduct, was broken through, and the embankment carried off.

Such was the destruction visited upon this portion of the main line of improvement in the short space of a few hours, by a sudden rise of the waters unknown in that country.

I should mention that the supervisors have cleaned out the dams, particularly on the middle division, where sand had been deposited and the navigation heretofore interrupted in times of low water. It is thought the repairs will not exceed, altogether, $300,000, which is much less than the estimate made immediately after the break took place. That estimate was made from a hasty glance of the eye over the work, when things wore their worst appearance. But the economical and early completion of these repairs must be attributed wholly to the energetic measures taken by the board, and to the efficient and masterly manner with which the supervisors have conducted the

work. It would require time and assistance to measure the work done. It would be impossible too to arrive at exactness in the measurement. Its scattered and broken parts and irregular shapes, and much of it now under water, will render measurement an uncertain approximation. Should the board desire it however, a party shall be sent on that duty. Any one who reflects for a moment will approve the wisdom of the board in hastening the completion of these repairs, at the earliest practicable period. The tolls which will be received this fall on account of their being finished, which will be the tolls from the mouth of the Juniata to Hollidaysburg, will no doubt more than pay the interest of the money expended till next spring—and the canal will be in complete readiness for the earliest spring business, the banks having had good time to settle.

PORTAGE RAIL WAY.

I would respectfully call the attention of the board to some repairs which will shortly be required on this road. The tracks on the inclined planes were laid with wood, plated with the flat bar. The wood is in a decayed condition—the tracks may with some difficulty be kept in order during the next season; but it requires some time to collect materials; and when relaid, it should by all means be with the edge rail. The cost of procuring materials and laying double tracks of edge rails on all the planes, would be as follows, viz:

1095 tons iron edge rails, &c.,	at $70		76,650 00
17,600 locust ties,	at 50		8,800 00
450,000 ft. mud sills,	at 10	per M.	4,500 00
2,200 rods laying,	at 10		22,000 00
Total,			$111,950 00

It is found that locomotives work on the short levels on the mountains with much greater advantage than horses, both as regards economy, and the dispatch of business, six new locomotives could be profitably added to that road the next season. Cost at $7,000 each, equal to $42,000.

INLET AT PETERSBURG.

This work is under contract, and will be completed during next month. It is thought that the appropriation of $5,000 made for it will be sufficient.

LOCKS BELOW DUNCAN'S ISLAND.

Two of these locks will be completed this fall. The lift lock and lower guard lock. The masonry of the upper guard lock will not be commenced this fall. The pit for this lock is nearly all solid rock, hard to blast and difficult to get out. It seemed impossible to get at

Showi *nd intermediate offices;*

	n off at Ports-mouth.	Taken off at Philadelphia.
Flour,		
Wheat,	48,089	153,032¼
Corn and	323,144	33,853
Clover a	246,592	205,891½
Potatoes,	25,732	4,360½
Salted be	5,694	6,031½
do. P		
Bacon,		120
Fish,	1,250,726	6,246,791
Butter an		
Lard and	691,544	279,575
Salt,	121,306	66,235
Provision	130	
Feathars,	440,752	331,330
Wool,	8,084	377,219
Cotton,	41,761	955,427
Hemp,	140,031	996,140
Tobacco,	226,117	725,378
Leather,	152,005	4,464,74
Haw hides	439,037	877,21
Furs and p		9,47
Whiskey a	39,850	
Merchandi	272,303	645,818
Groceries,	5,721	815,715
Oil,	8,092	7,045
Drugs and	818	843
Gypsum,	362	26,561
Furniture,		
Window gl	68,104	159,154
Rags,	1,102	3,618
Mineral coa	96,357	140,304
	6,909	1,044

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17,600 locust ties,	at 50		8,800 00
450,000 ft. mud sills,	at 10	per M.	4,500 00
2,200 rods laying,	at 10		22,000 00
Total,			$111,950 00

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Showing the amount of property shipped Eastward from Pittsburg, Johnstown, Hollidaysburg and intermediate offices: also the amount taken off at Portsmouth and Philadelphia.

ARTICLES.		Pittsburg, East.	Johnstown East.	Hollidaysburg East	Intermediate offices East.	Taken off at Portsmouth.	Taken off at Philadelphia.
Flour,	barrels	101,725	87,261	100,801	91,453	48,089	153,032½
Wheat,	bushels	48,557	40,238	63,113	191,310	323,144	33,853
Corn and other grain,	do.	1,713	3,987	2,209	366,573	246,592	205,891½
Clover and other grass seeds,	do.	180	742	895	6,308	25,732	4,360½
Potatoes,	do.		873	274	12,132	5,694	6,031½
Salted beef,	barrels				64		
do. Pork,	do.	1,007	513	915	1,009		120
Bacon,	pounds	8,211,175	8,077,865	6,715,942	1,021,864	1,250,726	6,246,791
Fish,	barrels	55		41	17		
Butter and cheese,	pounds	32,729	22,467	84,770	457,730	691,544	279,575
Lard and tallow,	do.	469,976	443,852	402,375	32,557	121,306	60,235
Salt,	bushels		12,071	3,112	25,134	130	
Provisions not specified,	pounds	12,235	4,711		4,851,695	440,752	331,330
Feathers,	do.	35,682	19,375	25,504	8,810	9,084	377,219
Wool,	do.	865,077	974,146	395,408	83,531	41,761	955,427
Cotton,	do.	1,045,350	881,775	836,643	308,502	140,031	996,140
Hemp,	do.	908,232	749,597	795,800	79,428	226,117	725,378
Tobacco,	do.	4,886,915	4,404,992	4,040,485	1,473,667	152,005	4,464,74½
Leather,	do.	6,492		4,662	729,004	439,037	877,21½
Raw hides,	do.	36,886	133,143	614	53,444		9,479
Furs and peltry,	do.	159,656	32,428	177,669	17,646	39,850	
Whiskey and domestic spirits,	gallons	252,910	4,752	9,585	764,910	272,303	645,818
Merchandize,	pounds	690,702	232,844	120,319	295,465	5,721	815,715
Groceries,	do.	315,680	89,335	87,493	19,791	8,092	7,045
Oil,	gallons	44,540	1,034	2,016	1,342	818	843
Drugs and dye stuffs,	pounds	22,951		5,977	10,419	362	26,561
Gypsum,	tons			18	429		
Furniture,	pounds	330,221	89,185	71,388	333,645	68,104	159,154
Window glass,	boxes	362,560	1,521	3,270	376	1,102	3,618
Rags,	pounds	41,493	23,000	30,362	176,908	96,357	146,304
Mineral coal,	tons	530,000	98	5,193	633,992	5,909	1,044
Iron ore,	do.						
do. Pigs and castings,	pounds	409,814	329,661	1,191,472	9,629,722	7,238,928	1,532,456
do. Bloom, bar and sheet,	do.	1,880,357	99,882		5,747,948	3,381,332	3,602,158
Lead in pigs and bars,	do.			300	143,986		28,260
Copper and tin,	do.	1,593			650		
Marble,	do.				1,702,346		1,236,433
Lime,	bushels				38,315		350
Limestone,	perches				238		
Slate for roofing,	pounds						
Bricks,	number	3,500	9,020	2,251	48,412	222,258	
Timber,	feet			8,078	164,592	174,198	
Sawed lumber,	do.	85,000	43,463	177,107	3,662,244	620,986	1,362,296
Staves, heading, and hoop poles,	pounds		10,116	51,748	624,851	647,954	2,700
Shingles,	number	7,000		25,000	674,170	96,700	297,800
Post and rails,	do.		35,678	855	6,051		36,268
Sundries,	pounds	1,707,764	307,604	522,426	3,415,753	2,046,836	5,470,203
Number of boats and cars cleared,		2,505	12,717	1,655	43,590	1,284	26,817
Passengers, miles travelled,		3,050,170	216,877	21,513	6,057,509	298	2,250,568
Amount of tolls received,							

the bottom of the pit. The contractors, James Martin & Co. worked with all diligence. As the river rose with the fall rains, the water became difficult and expensive for the contractors, and it would soon be too late to lay mortar. It seemed best to stop the work for this season.

It is now at a stand. The appropriation which was made for these locks will not be sufficient to complete them. The excavation comes much higher than was estimated on account of its being chiefly rock. It was necessary to make a road round the lower guard lock, and to take down the lock house and build a new one. In consequence, the cost has been run up. The cost of completing these locks over and above the appropriation of $19,000 made for them will be, as estimated, $16,000. It must be observed that an appropriation for deepening the canal below Duncan's Island was connected with the appropriation for these locks. The deepening of the canal having to be done in the winter was expensive, and the thickness of the lock walls was increased, which increased the amount of masonry; and these are the reasonable excuses which I beg to offer the board for asking an increase of appropriation for this work. The dam across the river at this point has been thoroughly overhauled and repaired, for less money than the appropriation for it. The repairing of the dam, the doubling of the locks and deepening the canal, will be a vast improvement, and completely put a stop to all interruption to the navigation here in future.

WISCONISCO CANAL.

For information respecting the condition of this work, I beg leave to refer the board to the accompanying report of the assistant engineer, who had charge of the work up to the 3d inst. This canal will be a complete work in itself, commencing as it does at the source whence it will derive its revenue. The Lyken's Valley abounds in coal. Canals leading into the coal regions have always proved profitable. Reasoning from analogy and judging from its own previous resources, this canal will be among the most profitable of the state improvements. Independent of the reasonable prospect of a profitable revenue from tonage on its own waters, it will proportionably increase the revenue of the main line. I would respectfully remind the board of the necessity of bringing the feeder from Walter's Mill, two miles and a quarter above Millersburg. This will make the canal as perfect as could be asked for.

RAIL-WAY TO AVOID THE COLUMBIA INCLINED PLANE.

For information respecting the condition of this work, I beg leave respectfully to refer the board to the accompanying report of the

assistant engineer in charge of it. The final cost of this work as is shown will exceed the appropriations by $69,000, including the cost of the depot and smith shop, and grading a street back of the collectors office, which are not properly items in the cost of the rail way to avoid the plain, but are consequent upon the increasing business of the Columbia and Philadelphia rail road, The balance of the excess arises from the causes stated in the assistants report, and from former estimates being lower than the work could be done for.

Bids for laying the rails were much higher than the estimated price. And more materials for laying the tracks are required than were estimated. Some of the excavations being too soft for stone blocks, require the mud sill and cross tie—and excavations at other points turned out more hard metal than was anticipated. These and the reasons given in the assistants report are very respecfully submitted to the board as the unavoidable causes of the increased cost of the work. The interest on the cost including all expenses of damages and fencing will still be less than the annual cost of maintaining the plane, and independent of any saving, the facilities it will give to the business of the road, may be considered sufficient satisfaction, without farther gain. The weather has been wet and unfavorable for some time back and prevented the contractors for laying rails from making much progress, but it is hoped a single track will be ready for use by the latter part of next month. It will be better not to lay but one track this fall for the banks are still green and unsettled. By spring they will be better compacted together and will form a more substantial foundation for the road.

COLUMBIA AND PHILADELPHIA RAILWAY.

The north track between Broad street and the foot of the Schuylkill plane, has been nearly all relaid with edge rails the past season and hands are now employed in completing it. But little has been done west of the plane for want of materials. Part of the iron contracted for, for the repairs, has but lately arrived from England.—Hands are at work taking up the old stone track, and drilling the stone to be relaid with edge rail, and the track will be completed as fast as the iron will arrive. The north track from the intersection of the West Chester road to the head of the plane has been in a condition not safe for locomotives since last spring and the business has been done altogether with some inconvenience on the south track, except the way business done with horses. There were $59,000 appropriated last winter for renewing a portion of this track.

The amount which will be required to complete these repairs will be 199,381 00

Estimated as follows, to wit:

2324 tons edge rail,	at	$70	162,680 00
38,720 locust cross ties,	"	80	30,976 00
950,000 feet mud sills,	"	12 pr. m.	11,400 00
7040 rods laying,	"	5	35,200 00
			240,256 00
Deduct appropriation,			59,000 00
			181,256 00
Add 10 per cent.			18,125 60
Amount required,			$199,381 60

The work might progress gradually, say one half next year, and the remaining half the following year. This, however, is very respectfully submitted for tho consideration of the board. The new bridge ot Valley creek cost something over $12,000. The temporary bridge first erected cost rather more than was expected, and the whole amounts to something more than the appropriation of $15,000 made for the purpose, which will be shown by the superintendent of repairs.

The invention of rail roads of latter times, and the application of steam as a moving power upon them, forms a new epoch in the history of the world, and will revolutionize the moral government of nations by speading knowledge and enlarging the intercourse of men. It would be profitable at any cost to extend the Columbia road through the state to Pittsburg. The amount of travelling it would at once create, may be inferred from the immense increase of travelling between all important points connected by rail ways.

OUT-LET LOCK AT DUNCAN'S ISLAND.

The estimate of the cost of this work was presented to the board some time ago. It will be about $16,000. Which is $6,000 more than was appropriated for it. The contractors are at work getting materials ready for it.

AQUEDUCT ABOVE DUNCAN'S ISLAND.

The trunk of this heavy aqueduct is in a falling condition. It was supported by trestles the past season. Its length is about 560 ft. To renew the trunk will cost $25 pr. ft. Whole cost $14,000.

RECAPITULATION.

Showing the amount required to complete works under contract, above the amount already appropriated.

Wisconisco canal	286,177
Rail way to avoid the plane,	69,024
Locks below Duncan's Island,	16,000
Out-let lock on Duncan's Island,	6,000
Total,	$377,201

Amount estimated for repairs.

Portage inclined planes,	111,950
Northern track of Columbia road,	199,381
Juniata aquaduct,	14,000
	$325,331

The above report with accompanying documents, I have the honour respectfully to submit to the board.

JOHN P. BAILY.
Engineer.

Report of A. Mehaffy, Superintendent of Philadelphia and Columbia Rail Road.

To the Hon. Board of Canal Commissioners.

GENTLEMEN:—Having in Report of last year given a full and detailed statement of the Motive Power department in its various branches, the undersigned does not deem it necessary to recapitulate further than briefly to acquaint the Board with the operations of the year just closed.

The trade of the road remained uninterrupted during the whole of last winter, except on the 18th of March.

On that day the track was suddenly obstructed by a snow storm, which impeded the progress of the train so much, as to prevent them from reaching the points of destination until the next day.

The burning down of the Valley Creek bridge, which occurred on the 29th of March, was a most serious loss to the State and disadvantage to the transporting public. This together with the breach on the Juniata, in June greatly operated against the road and much diminished the receipt of toll. These unfortunate and unavoidable calamities made it very certain that the promise in the last year's report, of returning a much increased excess of motive power toll, could not be realized.

Still it affords the undersigned great pleasure under all the disadvantages of the season, to inform the board that the excess over expenditure, is $39,231 80, which is sufficient to pay seven per cent on the cost of all the engines upon the road. This result is no less gratifying to him than it will be to the board and those who so earnestly contended for the use of steam as a motive power. Had there been no interruption, the excess would doubtless have been $60,000. This sum with proper management will beyond all doubt, be realized the ensuing year, unless again prevented by a recurrence of similar and unavoidable circumstances.

While alluding to the condition of the motive power fund, it may not be improper to remark that the whole amount of *rail road* toll, received during the year after paying all the expenses of repairs and supervision, will yield within a trifle of seven per cent on the original cost of the road. Last year it paid five and a half per cent, with a reasonable increase of business next season, it will pay ten per cent. The whole toll received on passengers and merchandize during the fiscal year was $396,863 98, being an increase over that of last year of $48,201 15, or within a fraction of fourteen per cent.

The $559,77 asked for in last year's report, to be applied to the payment of two tenders purchased from McClurg, Wade & Co. was duly appropriated, and that account is now closed.

By a resolution of the board six engines, viz: "James Madison," "Independence," "Lafayette," "Constitution," "United States" and "Comet," the first five built by William Norris of Philadelphia, and the last one by the "New Castle manufacturing company," were sent to the Portage road. These together with those alluded to in former reports as being unfit for use, left but twenty-seven efficient engines on the road. These will not be adequate to meet the increase of trade next season. It will require at least ten new ones. For this purpose, an appropriation of $70,000 is respectfully asked, unless it is thought proper to appropriate the excess of motive power toll, as far as it will reach.

The success and profit of the motive power department depends principally upon; 1st. The road being at all times in the best possible state of repair; 2nd. The use of none but the best locomotives; 3d. A sufficiency of engines with tools and other machinery to keep them in good repair; 4th. *Sober, skillful* and attentive engineers to run the engines—such as are now on the Columbia and Philadelphia road, and 5th. A watchful eye on the expenditures.

The board will find in report of last year the names of all the engines, with explanations as to their power and efficiency—the cost to the state of transporting one ton of frieght one mile—the amount of rail road and motive power toll charged—the number of rates of toll chargeable—amount of tolls received by the state on each ton or cwt. of merchandize—toll on each passenger from Columbia to Philadelphia, &c. &c. It is needless to touch on these points again, as there have been no further experiments, nor any alteration since that time, save a reduction of tarift on the article of domestic spirits, which was so high as to exclude it from the road. This reduction has beyond a doubt added to the profits of the road.

In accordance with a former recommendation, an additional number of State agents have within the last year been placed on the burthen trains. Besides the security ensured, they have caused to be paid to the different Collectors $990 50 beyond the amount paid for their services. Not only this, but the system of free travelling so extensively indulged in on these trains for some time past, has been thoroughly broken up, and the travel driven into the regular passenger trains, where the fare is collected and the legal toll charged. The result has been most salutary in an other respect. They can as the responsible and authorized agents command a more close attention to the breaks by the car agents of the different Companies on descending grades, except when a refractory and ill disposed man is met with—one who is unwilling to do his duty in any position. It is to be regretted that some of this class are to be found on the road, unless some authority is recognized, or license given to the proper officers, to prevent such as will not comply with the regulations from continuing in a situation to violate them, it is believed that the state had better put an end to all connection with Companies, and take the whole business into the hands of her own agents, under the control of one responsible head—with such an arrangement, the operations on this road could be

systematized, the public business done with far more economy and profit to the Commonwealth, and travel and transportation performed with greatly increased satifaction and safety to the public.

The building recommended and authorized at Parksburg for the superintendent of Machinery was put under contract during the season by the proper officers, and will be completed in the course of a few weeks.

An appropriation of $4000, for ropes will be necessary in addition to the balance remaining in the Treasury, and appropriated for that purpose at the last Session of the Legislature.

With the view of expediting the business between Broad street and the foot of Schuylkill Plane, the laying of an additional or third track from the latter place across the Schuylkill Bridge is recommended. This would be important to the trade of next season, and the expense would be trifling.

In case of accident or unavoidable delay to any of the trains between the plane and Paoli, the trains west of the last named point, are often detained much to the delay and annoyance of Passengers—particularly those not possessed with what is so very essential in the event of a break-down or other casualty—*patience*. This state of things is produced by the entire disuse of that portion of the north track, to obviate which it is all important that the balance of the appropriation necessary to complete this portion of the road should be made as early as practicable. If this be done, the work may be prosecuted during the winter, should the weather prove favorable, and thus every facility be afforded to the increased trade of next season.

The Chief Engineer Mr. Baily has no doubt in his report furnished an estimate of the cost.

The same inconvenience is for the present experienced at the western end of the road, tho' not to the same extent. The South track is being taken up and transferred to the line to avoid the Plane. The whole of the grading on this work is completed, and one track will be laid during the winter. It will be advisable—however, to continue running on the old track—until spring. By that time the embankment will have become settled, and the block and cross-ties can be re-adjusted and made more secure for the use of the heavy Locomotives For further particulars, in relation to this valuable work the Board are respectfully referred to the report of Mr. Baily chief engineer.

It will be important, previous to the abandonment of the present track, that measures be taken to supply the station at Columbia with running water. To accomplish this it is understood that the "Columbia Water Company" have proposed to furnish a supply at the same price as is paid in the City of Lancaster, except that their proposition is saddled with some restriction, which in the opinion of the undersigned ought not to be recognized by the Board.

He would therefore, suggest unless the same terms be granted as at Lancaster, that the State bring the water at her own expense, as has been recently authorized at another station—Leaman Place.

The distance necessary to bring the water at Columbia, is about 7000 feet, and agreeably to the estimate of the engineer, would cost about $7000, (see his report.)

The engine building and stationary engine at Columbia plane, will not be wanted after next spring, the Board will therefore, take such action in relation to them as shall seem to be required by the public interest.

Most of the north track from Broad street to the foot of the plane, has been greatly improved during the season, by substituting edge rails on stone blocks and locust ties for wooden and continuous stone sill plated with flat bars. The whole of it will be completed in the course of a week or ten days.

Very little has been done towards renewing the track west of the plane, because of the non-arrival of the T rails, which were ordered from England last spring, and expected about the first of August, but did not reach this country before the last of October. This is much to be regretted. The track was in such a wretched and unsafe condition that the breaking of crank-axles, locomotive springs and cars of companies and individuals, was of such frequent occurrence, that it was deemed most economical and prudent to abandon it altogether (except occasionally when used by horse cars) about the first of August, and consequently all the engines were placed on the south track for a distance of 18 miles.

Serious inconvenience is experienced by running all the locomotives in both directions on the same track—the loss also both to the state and owners of cars is very great, because it is found necessary to start the engines from the head of the plane at regular hours, whether they have full trains or not. This is unavoidable, that they may reach the termination of the 18 miles before the arrival of the trains from Columbia, and thus prevent collision.

So much has been said on former occasions of the heavy annual expense, and delay to passengers and goods consequent to the *nuisance* near Philadelphia—the inclined plane, that any thing more on that subject is deemed unnecessary. The views heretofore entertained remain unchanged.

Statement A, will show the Superintendent's account with the State Treasurer.

Statement B, will exhibit the Motive Power toll and expenditure.

Statement C, will show the nature of the expenses in the Motive Power department, and the whole amount.

Statement D, will exhibit the names of all the agents employed in the motive power department during the year, with their duties, time of service, daily pay, and amount paid each. Those marked with a star, have either been discharged or promoted.

Statement E, will exhibit the names, builders, commencement of running, and cost of all the engines, from the commencement of operations on the road to the 31st October, 1838, with remarks as to their condition and position at this time.

Statement F, will show the number of through and way passengers transported, and number of miles travelled on the Columbia and

Philadelphia rail road. Also the amount of rail road and motive power toll received at the different offices during the fiscal year, ending October 31, 1838.

Table G, will show the whole amount of appropriation asked for in this report.

After these general remarks as to the condition of the motive power department, the undersigned will proceed to notice the most interesting and important feature connected with the operations of the year, viz: The introduction of anthracite coal as a generator of steam in locomotives.

Agreeably to a resolution of the board dated June 2d, 1838, directing two engines to be fitted to the use of anthracite coal, as soon as practicable, a series of experiments was commenced, which has produced the most gratifying result.

Knowing that all former experiments on the road were unsuccessful, and being fully satisfied from practical experience of the impossibility of keeping up a fire with anthracite coal for a length of time, so as to convey a full train without the aid of wood, or some contrivance to produce a blaze, he decided in connexion with Mr. Brandt, (Master machinist,) to attach a fan in front of the boiler of one of the locomotives, and thus create a draft. This together with some trifling alterations in the engines promised in theory to answer a good end, but when brought into practice was found insufficient to keep up the fire at all times and under all circumstances, as the fan could be put in requisition only when the locomotive itself was in motion.

On other roads of shorter extent, low grades and mere passenger business, it might possibly have done tolerably well, though it is exceeding doubtful.

These have failed, the idea was suggested by Mr. Brandt, of placing a fan of a different construction immediately in front of the ash pan, and driving it by a seperate engine. This was concluded.

Accordingly a small engine of four inches cylinder, and eight inch stroke, was built by Mr. Brandt, and by him placed on the left side of the boiler, whence the steam is conveyed to the cylinder by means of a small lever or handle connected with the valve, and within reach of the engineer, who can at pleasure regulate the draft as circumstances may require.

This small engine is supported by the frame and boiler of the locomotive, and its motion is as steady and regular as if it were stationary.

The superiority of this beautiful arrangement, is its simplicity and being at all times easy of access.

It is not intended to convey the idea that the arrangement is perfect. It is doubtless susceptible of improvement. But the most prominent obstacles has beyond a doubt been overcome, viz: the impossibility of keeping the fire alive and producing a blaze sufficient to sustain a regular temperature at all times.

With this arrangement the blower is available whether the locomo-

tive is standing or moving, and will enable the fireman to raise steam before leaving the depot, as is now the case with the use of wood.

The quantity of coal consumed from one plane to the other, (distance seventy seven miles) with a train of twenty or twenty-five loaded cars, is about one and a half tons at four and a half dollars per ton retail price. A train of the same weight would require two cords of oak wood, the average price for which, cut and split ready for the engine is four and a half dollars a cord, thus showing a gain in favor of the coal thirty-three per cent. Besides, coal enough can be loaded on the tank at Columbia to carry the train to Philadelphia without the loss of time and cost of labor, consequent upon stopping and loading wood every twelve miles or thereabouts.

There is no road of the same magnitude in this country on which anthracite coal can be used as a generator of steam to the same profit as this. Coal by the quantity and of the best quality, can be had at Columbia at four dollars per ton, at which price the saving in the use of it instead of wood, would be exactly 50 per cent.

On the Baltimore and Ohio road the same quality is worth $7 50, or nearly double, and yet that company continue to use it on the engines.

In addition to the saving produced by using coal, the safety of bridges, and of private property along the line, will be a powerful inducement to adopt it as the only fuel. Nor should it be forgotten that if wood be continued in use, the commonwealth must expect to pay a much higher price for it year after year. This effect is already experienced on the eastern portion of the road, and will, as a matter of course, soon become general.

The locomotive above described is now performing her regular work from day to day. Another on the same plan will be ready in the course of ten days.

With the approbation of the Board, the remaining efficient engines can be altered during the present year, so as to burn anthracite coal to the exclusion of wood entirely, except for the mere purpose of kindling the fire.

All which is respectfully submitted.

A. MEHAFFEY,
Supt. Col. & Phil. R. R.

Rail Road Office,
Lancaster, Nov. 1838.

Statement showing the Superintendents account with the State Treasurer.

MOTIVE POWER.

Balance on hand, Nov. 1st, 1837,	$834 61¼	
Amount drawn from State Treasury, from 1st Nov. 1837, to 31st Oct. 1838,	$143,830 79	
	$144,665 40¼	
Amount expended during the same period,	143,204 34	
Balance in hand,		$1,461 00¼

LOCOMOTIVES.

Balance on hand, Nov. 1st, 1837,	$540 23	
Amount drawn from State Treasury,	559 77	
	$1,100 00	
Amount expended,	1,100 00	

Statement of the Motive Power toll and expenditure.

Amount of motive power toll earned and paid into the State Treasury, between the 1st Nov., 1837, and 31st Oct., 1838,			$164,052 74
Amount paid for motive power operations during same period,		$143,204 34	
Amount of debts contracted in the same time,		5,600 00	
		$148,804 34	
Deduct the sum paid for transhipment of goods round V. C. Bridge, which is not properly chargeable to motive power,	$3,283 40		
Deduct stock on hand, such as fuel, iron, oil, &c,	$11,700 00	$14,983 40	$133,820 94
Actual excess over expenditure,			$30,231 80

ABSTRACT STATEMENT.

Expended	at	Parkesburg Shop,	$11,626 64
do	"	Columbia do	1,835 25
do	"	Schuylkill do	640 16
do	"	Columbia Plane,	8,913 90
do	"	Schuylkill do	8,029 00
do	for	Superintendent, Clerk, Passenger Car Agent, &c.,	6,022 50
do	"	Car Inspeetors,	1,196 00
do	"	Burthen Car Agents,	1,999 50
do	"	Conductor of State Cars,	407 50
do	"	Engineers of Locomotives,	10,786 00
do	"	Firemen do	6,662 87½
do	"	Watermen,	6,825 00
do	"	Woodmen,	8,212 22
do	"	Wood,	27,889 33¾
do	"	Coal,	10,732 67½
do	"	Materials for Engines,	20,720 91¼
do	"	Oil " do	6,568 85
do	"	Transhipment goods round V. C. bridge,	3,283 40
do	"	Miscellaneous,	852 62
			$143,204 34

D.

Statement showing the names, duties, time of service, daily pay, and amount paid each of the Motive Power Agents on the road during the year.

Names of Agents.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
PARKESBURG SHOP.					
John Brandt,	Master Machinist.	365 days.	$4 00	$1,460 00	
James T. Paxton,	Manager.	130	1 50	195 00	
do.	do.	183	2 00	366 00	
Henry Tallman,	Smith.	297	1 92	570 24	
*George Hocksworth,	do.	55	1 66	91 30	
Charles Irwin,	do.	103½	1 66	171 81	
do.	do.	79	1 75	138 25	
do.	do.	79	1 87½	148 12½	
John Quin,	do.	27	1 50	40 50	
do.	Helper.	139⅛	1 25	174 37½	
do.	do.	78	1 50	117 00	
Isaac Stern,	do.	229½	1 50	344 25	
Isaac P. Lewis,	do.	47⅓	1 33	63 17½	
*John Gear,	do.	86½	1 25	108 12½	
William Rees, jr.	do.	52	1 25	65 00	
do.	do.	67¼	1 16	78 30	
James M'Namee,	do.	125	1 25	156 25	
John Oliver,	do.	25	1 25	31 25	

William K. Sloan,	Helper.	78	1 16	90 48
do.	do.	92	1 25	115 00
John Franciscus,	do.	14½	1 25	18 12½
*Thomas Hocksworth,	do.	44½	1 16	51 62
*James D. Brinkerhoof,	Boiler-maker.	4	1 50	6 00
William Carter,	do.	235	1 92	451 20
Ferdinand Lechler,	Copper-smith.	80½	1 50	120 75
*Abraham Pelan,	Engin. of stat. engines.	39	1 16	45 24
Benjamin Franck,	do.	261½	1 16	303 34
do.	Watchman.	56½	1 16	65 54
William K. Sloan,	do.	41	1 16	47 56
Joseph Hughes,	Wood-worker.	158	1 75	276 50
do.	do.	153	1 66	253 98
Isaac P. Lewis,	do.	206	1 33	273 98
Hiram Baldwin,	do.	303	1 33	4 2 99
*John Philips,	do.	55½	1 33	73 15
James M'Namee,	do.	27	1 33	35 91
James Bowman,	Repairing st. engine.	13	2 25	29 25
do.	Machinist.	117	1 75	204 75
do.	do.	43	1 87½	80 62½
William Hardman,	do.	313	2 00	626 00
*Seymour Bennett,	do.	1	1 83	1 83
*Benjamin Lawson,	do.	60½	1 75	105 87½
David Pollock,	do.	204½	1 75	357 87½
Joseph Pollock,	do.	75½	1 75	132 12½
*Hutton Grant,	do.	51	1 75	89 25
Samuel Barnford,	do.	173½	1 75	303 62½
Samuel Rhue,	do.	168	1 75	294 00

Names of Agents.	Duties.	Time of service.	Daily pay.	Amount paid each.	Aggregate.
*William Kirkham,	Machinist.	54	$1 75	$94 50	
Charles Lyons,	do.	13	1 75	22 75	
David Pollock,	do.	95½	1 66	158 53	
*Michael Bannon,	do.	104½	1 66	173 47	
*William Living-ton,	do.	23	1 66	38 18	
George Hebel,	do.	11	1 66	18 26	
do.	do.	47	1 50	70 50	
John Wood,	do.	41½	1 62	67 24	
*John Watts,	do.	261	1 58	412 38	
*Samuel Hardman,	do.	8½	1 50	12 75	
Lambert Osmund,	do.	129½	1 50	194 25	
*James Hutchison,	do.	41	1 50	61 50	
David Ralston,	do.	106	1 50	159 00	
do.	do.	164	1 33	218 12	
Charles Wood,	do.	133	1 50	199 50	
do.	do.	162	1 16	187 92	
*John Rooke,	do.	4	1 25	5 00	
Robert S. Rushton,	do.	109½	1 16	127 02	
*Joseph M'Clellan,	do.	154½	1 00	154 50	
John Brandt, jr.	do.	102	62½	63 75	
do.	do.	16	75	12 00	
					$11,626 64

COLUMBIA SHOP.					
*George Eagles,	Foreman.	181	1 75	316 75	
do.	do.	79	2 00	158 00	
*Henry Kamerer,	Smith.	177	1 50	265 50	
Daniel Stape,	do	311½	1 50	467 25	
*Thomas King,	do.	198	1 50	297 00	
Charles Hunt,	do.	177½	1 50	266 25	
Jeremiah Brown, jr.	do.	43	1 50	64 50	
					1,835 25
SCHUYLKILL SHOP.					
*Samuel Ogdin,	Smith.	168	1 66⅔	280 00	
Ludwick Young,	do.	60	1 00	60 00	
do.	do.	268	1 12	300 16	
					640 16
COLUMBIA PLANE.					
Henry Cassel,	Manager.	151	2 00	302 00	
do.	do.	183	2 50	457 50	
Joseph Bowman,	do.	31	2 50	77 50	
Abraham Varley,	Engineer stat. engine.	319	2 00	638 00	
John Jenks,	do.	41	2 00	82 00	
*George Heagy,	Fireman stat. engine.	31	1 00	31 00	
do.	do.	151	1 25	188 75	
Martin Funk,	do.	191	1 25	238 75	
*William Lockard,	do.	22	1 25	27 50	
John Jenks,	Rigger.	319	1 50	478 50	
Jacob Wagner,	do.	31	1 50	46 50	
*Jesse M. Knerr,	Telegraph man.	120	1 25	150 00	
*John Lockard,	do.	146	1 25	182 50	

Names of Agents.	Duties.	Time of service.	Daily pay.	Amount paid each.	Aggregate.
Joseph Bowman,	Telegraph man,	151 days.	$1 25	$188 75	
*Henry Charles,	do.	151	1 25	188 75	
*John Cassel,	do.	204	1 25	255 00	
John Hippey,	do.	214	1 25	267 50	
*Jacob Baumgardner,	do.	147	1 25	183 75	
James Steele,	do.	172	1 25	215 00	
John K. Fidler,	do.	64	1 25	80 00	
William Hippey,	do.	48	1 25	60 00	
John Kaine,	do.	27	1 25	33 75	
*Robert Harry,	do.	6	1 25	7 50	
*Mullison & Collins,	For horse power at head and foot of plane.			1,594 40	
Wilson & Caldwell,	do.			2,939 00	8,918 90
SCHUYLKILL PLANE.					
*John Alter.	Manager,	120 days.	2 50	300 00	
Solon Fleming,	do.	239	2 50	597 50	
Eli Williams,	Engineer stat. engine.	365	2 00	730 00	
Henry Shearer,	Fireman stat.	365	1 25	456 25	
*Henry Harrison,	Rigger,	304	1 50	456 00	
Frederick Leak,	do.	61	1 50	91 50	
do.	Assistant rigger.	102	1 25	127 50	

William Thomas,	Telegraph man,	365	1 25	456 25	
William Childs,	do.	365	1 25	456 25	
Joseph M'Gee,	Attacher,	365	1 25	456 25	
Jesse B. Dull,	do.	365	1 25	456 25	
Frederick Miley,	do.	365	1 25	456 25	
George Lambert,	do.	365	1 25	456 25	
William Conover,	Watchman,	365	1 00	365 00	
	for horse power at head	and foot of	plane.	2,624 00	8,029 00
SUPERINTENDENTS, CLERKS, CAR AGENTS, INSPECTORS, &c.					
Andrew Mehaffey,	Supt. motive power,	365	4 00	1,460 00	
Thomas Dickey,	Clerk in supt. office.	365	2 00	730 00	
William P. Beatty, Jr.	Manager Schuy'l. level.	365	2 50	912 50	
*Solon Fleming,	State agent pass'r. cars.	120	2 00	240 00	
Fabius Fleming,	do.	245	2 00	490 00	
Hugh L. Pedan,	do.	365	2 00	730 00	
Abraham Yousling,	do.	365	2 00	730 00	
John A. Kauffelt,	do.	365	2 00	730 00	6,022 50
Frederick Dern,	Car inspector.	365	2 00	730 00	
William B. Emerick,	do.	233	2 00	466 00	1,196 00
*Edward A. Martin,	State agent burden cars,	303	1 50	454 50	
Thomas B. Odell,	do.	315	1 50	472 50	
*Joseph Bowman,	do.	164	1 50	246 00	
Henry Charles,	do.	188	1 50	282 00	
John Lockard,	do.	197	1 50	295 50	
*Addison Haines,	do.	81	1 50	121 50	
William Evans,	do.	43	1 50	64 50	
John Cassel,	do.	42	1 50	63 00	1,999 50

Names of Agents.	Duties.	Time of service.	Daily pay.	Amount paid each.	Aggregate.
John Buchanan,	Conductor of state cars.	293	$1 25	$366 25	
*Joseph Hazlet,	do.	33	1 25	41 25	$407 50
ENGINEERS OF LOCOMOTIVES.					
Daniel Holl,	Engineer.	363	2 00	726 00	
Beale Few,	do.	344	2 00	688 00	
*Patrick Donahoe,	do.	54	2 00	108 00	
*David Currie,	do.	57	2 00	114 00	
*Fabius Fleming,	do.	60	2 00	120 00	
John Mellinger,	do.	364	2 00	728 00	
Elisha Hamill,	do.	341	2 00	682 00	
Isaac Dunn,	do.	334	2 00	668 00	
Frederick Lunger,	do.	340	2 00	680 00	
Kirk Few,	do.	364	2 00	728 00	
*Hugh Maloney,	do.	97	2 00	194 00	
*John Pelan,	do.	292	2 00	584 00	
Joshua Martin,	do.	304	2 00	608 00	
Allen Smith,	do.	159	2 00	318 00	
*Abraham Pelan,	do.	212	2 00	424 00	
*James Cann,	do.	192	2 00	384 00	
*Henry Holl,	do.	161	2 00	322 00	

Rudolph Graff,	do.	205	2 00	410 00	
Jenkins Few,	do.	190¼	2 00	381 00	
Robert Cunningham,	do.	16	2 00	32 00	
Isaac G. Treisbach,	do.	118	2 00	236 00	
Smith Lake,	do.	157	2 00	314 00	
*Robert S. Hamill,	do.	136	2 00	272 00	
Henry E. Hebel,	do.	127	2 00	254 00	
*George W. Brown,	do.	64½	2 00	129 00	
Joseph Cockley,	do.	52	2 00	104 00	
Charles Millinger,	do.	71	2 00	142 00	
Edward A. Howard,	do.	41	2 00	82 00	
William Beckley,	do.	46	2 00	92 00	
Isaac Bruce,	do.	31	2 00	62 00	
John Brandt, Jr.	do.	28	2 00	56 00	
John Carothers,	do.	27	2 00	54 00	
John Day,	do.	14	2 00	28 00	
George Heagy,	do.	13	2 00	26 00	
Henry Rhoads,	do.	15	2 00	30 00	
George Hebel,	do.	3	2 00	6 00	$10,786 00
FIREMEN OF LOCOMOTIVES.					
*Michael Kelly,	Fireman.	57	1 25	71 25	
Robert Cunningham,	do.	249	1 25	311 25	
*Henry Hall,	do.	143	1 25	178 75	
*James Cann,	do.	141	1 25	176 25	
*Abraham Pelan,	do.	61	1 25	76 25	
*Allen Smith,	do.	195½	1 25	244 37½	
*Robert S. Hamill,	do.	194	1 25	242 50	

D.—Continued.

Names of Agents.	Duties.	Time of service.	Daily pay.	Amount paid each.	Aggregate.
*Rudolph Graff,	Fireman.	125 days.	1 25	156 25	
*Joshua Martin,	do.	61	1 25	76 25	
*Abisha Moore,	do.	148	1 25	185 00	
*Jenkins Few,	do.	143	1 25	178 75	
*Henry E. Hebel,	do.	212	1 25	265 00	
John Brandt, jr.	do.	3½	1 00	3 50	
do.	do.	10	1 25	12 50	
*John Rote,	do.	42	1 25	52 50	
Joseph Irwin,	do.	10	1 25	12 50	
Charles Mellinger,	do.	196	1 25	245 00	
Isaac Bruce,	do.	220	1 25	275 00	
*Pennington Stoner,	do.	63	1 25	78 75	
*Conrad Collage,	do.	8	1 25	10 00	
*Nicholas Springer,	do.	98	1 25	122 50	
William Christy,	do.	65	1 25	81 25	
Edward A. Howard,	do.	188	1 25	235 00	
John Carothers,	do.	176	1 25	220 00	
*Richard E. Barrick,	do.	85	1 25	106 25	
George Snyder,	do.	221	1 25	276 25	
Henry Rhoads,	do.	184	1 25	230 00	
George Heagy,	do.	201	1 25	251 25	

James Miller,	Fireman.	7	1 25	8 75
William Beckley,	do.	170	1 25	212 50
Joseph Senanz,	do.	48	1 25	60 00
*Isaac G. Triesbach,	do.	22	1 25	27 50
Robert Robinson,	do.	126	1 25	157 50
John Day,	do.	133	1 25	166 25
Isaac Martin,	do.	190	1 25	237 50
*John Gear,	do.	69	1 25	86 25
Joseph Cockley,	do.	138	1 25	172 50
Joseph Withers,	do.	48	1 25	60 00
Oliver G. Howard,	do.	120	1 25	150 00
*Augustus Pelan,	do.	106	1 25	132 50
George Hebel,	do.	55	1 25	68 75
Joseph Brown,	do.	94½	1 25	118 12½
Jacob Foltz,	do.	101	1 25	126 25
John Sanders,	do.	49	1 25	61 25
Frederick Senanz,	do.	30	1 25	37 50
Isaac P. Lewis,	do,	52	1 25	65 00
George M'Guire,	do.	49	1 25	61 25
John Slack,	do.	43	1 25	53 75
Paul Conard,	do.	38	1 25	47 50
Thomas Doud,	do.	31	1 25	38 75
William Walling,	do.	31	1 25	38 75
Joseph Kinnard,	do.	31	1 25	38 75
George Crispin,	do.	29	1 25	36 25
William P. Hannum,	do.	17	1 25	21 25
*Alexander Traguair,	do.	3½	1 25	4 37½
				$6,662 87½

D.—Continued.

Names of Agents.	Duties.	Time of service.	Daily pay.	Amount paid each.	Aggregate.
WATERMEN.					
Gerhard Brand,	Waterman.	365 days.	1 00	365 00	
Michael Zeiffly,	do.	365	1 00	365 00	
Paul Trout,	do.	365	1 00	365 00	
Andrew Trout,	do.	365	1 00	365 00	
Samuel Bricker,	do.	365	1 00	365 00	
*John B. Ivester,	do.	365	1 00	365 00	
Major Whitesides,	do.	365	1 00	365 00	
Mahlon Robinson,	do.	364	1 00	364 00	
Jacob Ricksten,	do.	365	1 00	365 00	
*John Hutchinson,	do.	365	1 00	365 00	
Peter Donelly,	do.	365	1 00	365 00	
Joseph Irwin,	do.	299	1 00	299 00	
Conrad Collage,	do.	357	1 00	357 00	
Frederick Fohn,	do.	151	1 00	151 00	
Thomas Ross,	do.	365	1 00	365 00	
William M'Creddin,	do.	61	1 00	61 00	
Frederick Senantz,	do.	151	1 00	151 00	
*Mifflin Elliott,	do.	139½	1 00	139 50	
*John Campbell,	do.	184	1 00	184 00	
John Kelmer,	do.	122	1 00	122 00	

Thomas H. Patterson,	do.	60	1 00	60 00	
John Irwin,	do.	36	1 00	36 00	
John M. Ford,	do.	44½	1 00	44 50	
*Andrew Gurley,	do.	2	1 00	2 00	
Lancaster city water comp.	For supplying 4,195 Locomotives at 20 cts. each.			839 00	
					6,825 00
	WOODMEN.				
Jacob Wagner,	Woodman.	287½ days.	1 00	287 50	
Henry Dietz,	do.	313½	1 00	313 50	
*George Smith,	do.	287½	1 00	287 50	
Jacob Ocks,	do.	314½	1 00	314 50	
Peter May,	do.	314½	1 00	314 50	
George Geiger,	do.	314½	1 00	314 50	
William M'Credden,	do.	248½	1 00	248 50	
Joseph Senatz,	do.	269	1 00	269 00	
*William Sweeten,	do.	313	1 00	313 00	
Joseph Engleman,	do.	313	1 00	313 00	
Thomas H. Patterson,	do.	261	1 00	261 00	
Timothy Crowley,	do.	259	1 00	259 00	
Joseph Irwin,	do.	52	1 00	52 00	
Frederick Folm,	do.	183	1 00	183 00	
Edward Brown,	do.	12	1 00	12 00	
Henry Deikman,	do.	13½	1 00	13 50	
James Martin,	do.	52	1 00	52 00	
John Sheidenhelm,	do.	36	1 00	36 00	
*Henry Fordney,	do.	30	1 00	30 00	
Michael Broad,	do.	27	1 00	27 00	
George Senatz,	do.	27	1 00	27 00	
Edward Snyder,	do.	151 cords.	1 00	151 00	

D.—Continued.

Names of Agents.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
Edward Snyder,	Woodman.	119¾ cords.	$0 87½	$104 78	
James Hutchinson,	do.	145¼	1 00	145 50	
do.	do.	158¾	87½	138 91	
*John Walter,	do.	160	1 00	160 00	
Thomas Griffith,	do.	202½	1 00	202 50	
Eli M'Cann,	do.	332½	1 00	332 50	
James Scott,	do.	288½	1 00	288 50	
*Mifflin Elliot,	do.	65	1 00	65 00	
Nathaniel Rue,	do.	273½	1 00	273 50	
Cornelius Bewley,	do.	58	1 00	58 00	
William Dunn,	do.	117	1 00	117 00	
Peter Ingram,	do.	71	1 00	71 00	
*Edward Phelon,	do.	50¼	1 00	50 25	
*Rees & Leaman,	do.	624⅝	87½	546 53	
Daniel Rees,	do.	542⅜	87½	474 58	
Oliver P. Ross,	do.	866¼	1 00	866 25	
Samuel Dennis,	do.	1166⅜ cord'g.	12½	145 79½	
Thomas Hughes,	do.	269	12½	33 62½	
Joseph M. Woodward,	do.	37	12½	4 62½	
Israel M'Clellan,	do.	362½ draw'g	15	54 37½	8,212 22

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Names of Agents.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
Edward Snyder,	Woodman.	119¾ cords.	$0 87½	$104 78	
James Hutchinson,	do.	145¼	1 00	145 50	
do.	do.	158¾	87½	138 91	
*John Walter,	do.	160	1 00	160 00	
Thomas Griffith,	do.	202½	1 00	202 50	
Eli M'Cann,	do.	332½	1 00	332 50	
James Scott,	do.	288½	1 00	288 50	
*Mifflin Elliot,	do.	65	1 00	65 00	
Nathaniel Rue,	do.	273½	1 00	273 50	
Cornelius Bewley,	do.	58	1 00	58 00	
William Dunn,	do.	117	1 00	117 00	
Peter Ingram,	do.	71	1 00	71 00	
*Edward Phelon,	do.	50¼	1 00	50 25	
*Rees & Leaman,	do.	624⅝	87½	546 53	
Daniel Rees,	do.	542⅝	87½	474 58	
Oliver P. Ross,	do.	866¼	1 00	866 25	
Samuel Dennis,	do.	1166⅜ cord'g.	12½	145 79½	
Thomas Hughes,	do.	269	12½	33 62½	
Joseph M. Woodward,	do.	37	12½	4 62½	
Israel M'Clellan,	do.	362½ draw'g	15	54 37½	8,212 22

Exhibiting the number of Locomotive Engines placed upon the Columbia and Philadelphia Railway, from the opening of the road up to October 31, 1838. The time when they commenced running, the name of each engine, from whom purchased, the cost of each, with remarks as to their condition and position at this time.

Commenced running.	Names.	From whom purchased.	Cost of each.	REMARKS.
May 18, 1835.	Schuylkill,	M. W. Baldwin,	6,316 74	Excellent repair,
" " "	Delaware,	"	6,316 74	"
" " "	Susquehanna,	"	6,316 74	In ordinary,
" " "	Ohio,	"	6,316 74	Excellent repair,
" " "	Columbia,	"	5,580 04	In ordinary,
" " "	Pennsylvania,	"	6,316 74	Excellent repair,
" " "	Philadelphia,	"	6,316 74	"
" " "	Lancaster,	"	5,850 00	"
July 23, "	Kentucky,	"	6,400 00	" (on Schuylkill level,)
September 7, "	Juniata,	"	6,400 00	"
October 22, "	Brandywine,	"	6,400 00	" [road.)
July 7, "	Albion,	A. & G. Ralston,	6,507 64½	In ordinary, (useless for this
June 18, "	Atlantic,	"	6,507 64½	" "
May 18, "	John Bull,	"	6,422 83	" "
July 24, "	Fire Fly,	"	6,507 64½	Sold,
July 27, "	Red Rover,	"	6,507 64½	"
October 14, "	William Penn,	Long & Norris,	6,000 00	In ordinary,
July 13, 1836.	George Washington,	William Norris,	6,300 00	Sent to Portage road,
May 12, "	Robert Morris,	"	6,300 00	"
August 19, "	Benjamin Franklin,	"	6,300 00	"
October 18, "	Washington County Farmer,	"	6,300 00	Excellent repair,
September 1, "	America,	Coleman, Sellars & Son,	6,000 00	In ordinary,
" " "	Sampson,	"	6,500 00	"
May 28, "	Planet,	Young,	6,500 00	"
July 22, "	Columbus,	"	6,500 00	"
July 16, "	Comet,	"	6,500 00	"
February 22, 1837.	Conestoga,	M. W. Baldwin,	7,500 00	Sent to Portage road,
March 24, "	Edward F. Gay,	"	7,500 00	Excellent repair,

D.—Continued.

Names of Agents.	Duties.	Time of service.	Daily pay.	Amount paid each.	Aggregate.

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D.—Continued.

Names of Agents.	Duties.	Time of service	Daily pay.	Amount paid each	Aggregate

Exhibiting the number of Locomotive Engines placed upon the Columbia and Philadelphia Railway, from the opening of the road up to October 31, 1838. The time when they commenced running, the name of each engine, from whom purchased, the cost of each, with remarks as to their condition and position at this time.

Commenced running.		Names,	From whom purchased.	Cost of each.	REMARKS.
April	2, 1837,	Parksburg,	M. W. Baldwin,	$7,500 00	Excellent repair.
"	7, "	Octorara,	"	7,500 00	"
"	16, "	Downingtowo,	"	7,500 00	"
"	24, "	Pequea,	"	7,500 00	"
May	1, "	Indiana,	"	7,500 00	"
"	9, "	Mississippi,	"	7,500 00	"
"	15, "	Montgomery,	"	7,500 00	"
"	28, "	Wisconsio,	"	7,500 00	"
Jan.	19, "	West Chester,	"	7,000 00	"
Feb.	22, "	Virginia,	"	7,000 00	"
"	" "	Pacific,	"	7,000 80	"
March	3, "	Bald Eagle,	Garrett & Eastwick,	7,000 00	"
April	16, "	Telegraph,	"	7,000 00	"
May	23, "	Enterprise,	"	7,000 00	"
March	21, "	Lafayette,	Wm. Norris,	6,500 00	Sent to Portage road.
"	" "	James Madison,	"	6,950 00	"
April	17, "	Bush Hill,	"	7,500 00	"
May	22, "	United States,	"	7,500 00	"
June	12, "	Constitution,	"	7,500 00	"
July	4, "	Independence,	"	7,500 00	"
March	29, 1837,	Pittsburger,	M'Clurg, Wade & Co.	6,250 00	"
Nov.	18, 1836,	Backwoodsman,	"	6,250 00	"
July	7, 1837,	Two tenders, for two last	named engines,	1,100 00	"

RECAPITULATION.

Excellent repair 27	In ordinary 9.	Sold, 2	Sent to Portage road, 12	Total 50

F.

Showing the number of passengers transported, and number of miles travelled on the Columbia and Philadelphia rail road; also the amount of the rail road and motive power toll received at the different offices, during the fiscal year ending Oct. 31st, 1838.

MILES.		THROUGH PASSENGERS.		WAY AND THROUGH.
6,200,184	equal to	75,612	or	103,336

	RAIL ROAD TOLL.	MOTIVE POWER TOLL.
Columbia	$82,524 44	$75,718 64
Lancaster,	14,317 76	12,730 04
Downingtown,	11,264 41	8,799 46
Paoli,	4,560 06	1,121 64
Philadelphia,	120,144 57	65,6[illegible]2 96
Schuylkill viaduct,	777 51	
	$233,588 75	$164,052 74

G.

Estimated amount required for the ensuing year.

For ten locomotive engines,	$70,000 00
" additional set of ropes at plane,	4,000 00
	$74,000 00

RAILWAY TO AVOID THE PLANE.
Columbia, Nov. 5, 1838.

To JOHN P. BAILY, Esq.

Chief Engineer,

SIR—In compliance with your directions, I have the honor, respectfully, to submit the following report, showing the present condition of the railway to avoid the inclined plane at Columbia, and the estimated amount which will be required to complete the work.

Since my appointment as principal assistant engineer on this road, which took place on the 10th of March, of the present year, the work has been prosecuted in due accordance with your instructions, and with all possible despatch. Some unforeseen circumstances have however delayed its completion longer than was anticipated; among these may be mentioned the scarcity of hands here, occasioned by the great demand and high wages given elsewhere, and on account of the sickness that prevailed on the first, second, and third sections; there were no less than twenty hands sick in one of the shantees at one time. The increased cost of the work over the estimate of last year, arises from some alterations which were made in the plan and grades of the line, which increased the amount of excavation and embankment; and the amount of rock excavation was found to be more than was anticipated. Changes were also made in the plan and masonry of the bridges, which increased the cost. The masonry was changed from common rubble work to that of ranged hammer dressed masonry, and the amount of masonry also was increased.—These changes improve the road, and are worth their cost.

The foundation of the eastern abutment of Strickler's run bridge, which was put up last fall, gave way, and the wall opened so much during the winter, that it was thought best to take the whole of it down, and rebuild it. This is also an item of additional expense. The building of the depot, and grading a street back of the collector's office, which are necessarily connected with the business of the main line of road are added to the cost of making the railway to avoid the plane; but are not properly items in the cost of this work.

All of which is respectfully submitted,

JOSEPH C. STRODE,
P. A. Engineer.

Report of J. W. Patton, Superintendent, Allegheny Portage Rail Way.

Hollidaysburg, October, 31 1838.

T. Stevens, Esq.,

President Board of Canal Commissioners.

Sir—In my report of last year I stated that with a reasonable increase of business, the motive power tolls on the Allegheny Portage railway would this year be adequate to all the demands that would be made upon it, and that there would probably be a balance left sufficient to pay for ropes, and such additional machinery as would be required for next year. That it has not done so is owing to the break on the canal in June last, which operated most severely on the Portage railway. That it would have done so, is apparent from the fact that the amount of business done on the road up to the time of the break on the canal, was sufficient to pay the expense while the road was operating, and the expenses during the winter when it was not in operation, and still leave a balance on hand of about fifteen thousand dollars. After the break on the canal, business almost ceased, and there would have been a saving of money to the road by stopping until the canal was repaired, but the interests of the state required that the road should be kept open, even at a heavy loss to the commonwealth.

The expenses were reduced as much as possible, but from the nature of its construction, the expenses of this road cannot with propriety be reduced below a certain point, as a certain number of men are required to run the inclined planes; and it requires as many hands, and nearly as much fuel, to pass seventy cars per day, as it does to pass one hundred and fifty. And the same with the locomotives on the short levels. Consequently the expenses during the months of July, August and September, exceeded the tolls by about ten thousand five hundred dollars, which, together with six thousand five hundred dollars, paid for finishing locomotives, brought from the Columbia rail way, exhausted the balance on hand at the time of the break on the canal, and made a balance of $982 40, being the amount of expenses over the tolls. This statement includes the $6500 paid for finishing locomotives, which was not a legitimate charge on the motive power fund of the road, but which had to be paid out of that fund, as there was no other for the purpose.

The amount drawn from the Treasury since October, 31st, 1837, for motive power expenses is		$93,600 00
Motive power debts this day,		6,400 00
		$100,000 00
Amount of debts, Oct. 31, 1837,	12,000 00	
Expenses for the year ending this day,	81,500 00	
Paid for finishing locomotives,	6,500 00	$100,000 00
Amount of motive power tolls received at Hollidaysburg during the year ending this day,		$44,517 60
Amount of do received at Johnstown, same time,		36,000 00
Whole amount,		$80,517 60
Motive power expenses same time,		81,500 00
Expenditure over income,		$982 40

My anticipations respecting the advantages of using locomotives on the short levels, in place of horses, have been realized, as the expense is lessened, while the facility of transportation (particularly of burthen cars) is much increased. I would therefore suggest to the board the propriety of asking for an appropriation to purchase eight new locomotives, which would enable the superintendent to substitute engines in place of horses on some more of the short levels, and to dispense with the use of some of the engines first brought on the road, which are not fit to be used.

Of the locomotives on this road, those made by Mr. William Norris, of Philadelphia, are much superior, doing double the amount of work, with half the quantity of oil and fuel, and not requiring half as much repairs.

The appropriation for ropes and machinery has been applied to those objects.

In consequence of some of the ropes last received from Hudson, New York, wearing out much sooner than usual, there will be required a larger appropriation than was expected. A contract has been made for what ropes will be required, part of which was wanted and has been received this fall, and the balance will be received in the spring. The amount required to pay for the ropes, and some machinery yet wanted, is twenty-one thousand five hundred dollars.

Appropriation required for 8 locomotives,	$52,000 00
do do for ropes and machinery,	21,500 00

Respectfully submitted,

JOS. W. PATTON, Supt.

The quantity of fuel and materials on hand are larger than last year, and it is presumed that the expenses for repairs hereafter will not be so heavy.

Report of James D. Harris, North Branch Extension.

To the Board of Canal Commissioners of Pennsylvania.

GENTLEMEN:—I beg leave to present the following report on the state of the work in progress of construction on the North Branch Division of the Pennsylvania canal, between the New York state line, and Lackawana creek; together with estimates of the cost of the same when completed, as exhibited in detail in the accompanying tabular statements, wherein the work (so far as placed under contract) is estimated at the contract prices.

TIOGA LINE.

That part or portion of the North Branch Division between the state boundary on the Susquehanna and Wyalusing creek, is termed the "Tioga Line," and is forty miles and ten chains in length. Of this line thirty-five miles and fifty-six chains were placed under contract in October, 1836, beginning at the village of Athens, (four miles and thirty-four chains from the state line,) and terminating at Wyalusing creek. Since the date of my last annual report, the work on this line has been prosecuted with as much activity, and as much progress has been made, as the appropriation would warrant. Some difficulty was experienced in procuring laborers in the early part of the season. At present there is a pretty full force on the work. The progress made, as well as the estimated cost of the work yet to be done, are set forth in the tabular statements before referred to. For a particular description of the character of the work on this line, I beg leave to refer the board to my annual report, of November, 1836.

I would take the liberty of calling the attention of the board to the subject of communicating with the constituted authorities of the state of New York, relative to a connection with the canals of that state. During the last summer a survey was made in pursuance of an act of the legislature of New York, by an engineer of that state, under the direction of the board of canal commissioners, to determine the route, and probable expense of a canal from Binghamton, in Broome county, to the state line, near Athens. Binghamton is a flourishing village at the mouth of the Chenango river, the termination of the Chenango canal. This canal forms a connection between the Susquehanna at Binghamton, and the Erie canal at Utica, and is about ninety-six miles in length. The distance from Binghamton to the state line near Athens, was found to be about forty miles. It is expected that an appropriation will be made at the next session of the New York legislature, for the construction of this link in the improve-

ments. The propriety of taking measures to effect such a junction of the canals of the two states, as will be most conducive to the public interests is therefore respectfully submitted for the decision of the board.

It is not understood that any steps have been taken by the state of New York towards a connection with the Pennsylvania canal, by the way of the Chemung valley, but respecting a work of such vital importance to all western New York, it cannot be expected that the people of that state will be inactive. Judging from the best information procured on the subject, this link will be but about half the length of the canal to connect with Binghamton. When made, it will form a junction with the Chemung canal at Elmira, and with the Erie canal at Montezuma. If an early understanding could be had in relation to the mode of joining the canals, by this route, as well as by the Susquehanna valley, it would be expedient to have the towing path along the pool of the dam at Athens completed, and the out let lock at the head of the pool founded, before the dam is raised. The length of slackwater suitable for navigation will be about one and a half miles.

An estimate has been made of the cost of extending the canal from Athens up the Susquehanna to the state line, a distance of four miles and thirty-four chains. It amounts to $182,244 25, and is made on the supposition that the connection will have to be formed under the most unfavorable circumstances for Pennsylvania, as respects cost. A connection on the south west side of the river, and upon such plan that the canal from the state line to Athens would be fed by drawing water from the canal in New York, would be attended with least expense to Pennsylvania. But as there may be insuperable obstacles in the way of such an arrangement, it is deemed proper at this time to make the estimate on the assumption that the canal within the bounds of New York, will meet the state line on the north east side of the river, and that the connection between the canals of the two states will be made at that point. This plan will render a dam and towing path bridge necessary in the Susquehanna, below the state line, for the purpose of crossing the river. The dam is proposed to be built below Cayuta creek, and at the distance of two miles and twenty chains above Athens. It will be 5.50 feet in height above low water, and will form a dead pool as far back as the state line, at common stages of the water.

The pool will be sufficiently deep for slackwater navigation from the dam to the head of the narrows on the north east side of the river. From this point a canal will be carried to the state line. From the dam to Athens the canal is estimated at seventy feet wide on the water line, and five feet deep, that it may be sufficient not only for all the purposes of a canal, but to convey a full supply of water to Athens for manufacturing purposes. The ground is favorable for increasing the width, without excessive increase of cost. The object to be gained will well justify the increase of expense.

An estimate has also been made of the expense of a canal up the Chemung river, from Athens to the first crossing of the state line, four miles and twenty-two chains. The estimate includes the expense of a dam near the state line, for the purpose of feeding the canal, thence to the head of the pool of the Athens dam. The distance from the state line to this point is two miles and sixty-two chains. The dam will barely set back to the line at common stages of the water. It would be cheaper to dispense with this dam if the water for the supply of this distance (two miles and sixty-two chains) could be drawn from the canal in New York. The estimated expense of the canal from Athens to the state line on the Chemung, is $115,700.

The aggregate estimated cost of forming the connection with the New York canals by both branches, is $297,944 25.

The whole amount of work done on the thirty-five miles and fifty-six chains of the Tioga line under contract, up to the monthly estimate of the 15th October, 1838, was $625,832 54, as appears by the tabular statements. The estimated cost of the work yet to be done, is $761,254 01. Whole cost of the work under contract, when completed, $1,387,086 55, to which add the estimated cost of the canals up both branches, and the whole estimated cost of the Tioga line, including those connections, will amount to the sum of $1,685,030 80.

TUNKHANNOCK LINE.

The Tunkhannock line begins at Wyalusing creek, and extends to the Wyoming canal, at the head of the Wyoming Valley. The length of this line is fifty-four miles and nineteen chains. The location of the line was begun in the month of May, and was completed in the latter part of June.

The first section on the Tunkhannock line is designated as No. 59. This occurs in numbering the sections consecutively from Athens to Lackawanna. This section, as also sections 60, 61, 62 and 63, are located in the flats extending from Wyalusing creek to Browntown. The ground is favorable. Aggregate length of those five sections, two miles and forty-four chains.

Sections 64 to 75, inclusive, extend from Browntown past the narrows at Wyalusing falls, and end at Keeny's eddy. All of those sections except No. 64 and 65, will require walling. The material for forming the banks and lining the canal, is convenient, and of good quality. A large quantity of solid rock will have to be excavated on section No. 74, where the banks are precipitous. The proportion of solid rock on the other sections is much less, the slope of the hill less abrupt, and the material chiefly earth and detached rock. Aggregate length of those twelve sections, four miles and fifty-two chains.

Sections 76 to 83, inclusive, begin at Keeny's eddy, and terminate at the head of the narrows, at Skinner's eddy. The ground is generally favorable, except where the line intersects the Little and Big Tuscarora creeks. At those streams a considerable quantity of em-

bankment will be needed, particularly at the valley of the Little Tuscarora. Whole length of those eight sections, three miles and seventy five chains.

Sections 84 to 86, inclusive, are located past the narrows, below Skinner's eddy. The canal will have to be walled past those sections. The material is convenient, both for the protection wall and the banks. A new road will have to be made simultaneously with the canal, as a substitute for the present road, which will be destroyed. Aggregate length of those three sections, one mile and twenty-two chains.

Sections 87 and 88, extend from the narrows, past the Black Walnut bottom, to Howard's. The ground is favorable. Whole distance one mile and thirty-four chains, (two sections.)

Sections 89 to 92, inclusive, begin at Howard's, and terminate near Nicholas Overfield's. Section 89 is on the flat, and skirts the foot of the gravel bluff. No wall is required on this section. Sections 90, 91 and 92, will require walling to protect them against the river freshets. A road it is believed can be made independently of the canal past the narrows, at once at a moderate elevation above the canal bottom, on good ground, to supply the place of the present road, which must be occupied by the canal. Whole length of those four sections, one mile and thirty-four chains.

Sections 93 to 95, inclusive, are traced through the flats by N. and P. Overfield's, to the head of the narrows above Meshoppen. The ground is favorable for a canal. Whole length of those three sections, one mile and forty-six chains.

Sections 96 and 97 are located at the narrows, above Meshoppen. They will require a protection wall for near the whole length of them. The ground for a portion of the distance is favorable for a canal. The stone for wall rather inconvenient. The public road will be interfered with, but can be made anew above the canal at once. Whole length of those two sections, fifty-four chains.

Sections 98, 99 and 100, are traced along the flats by the mouth of Meshoppen creek, crossing that stream. The ground favorable. A new public bridge will be required over Meshoppen creek, in the place of one which will be destroyed. At the termination of section 100, the canal will connect with the pool of the dam, to be built at the Horse race, three miles below. Whole length of those three sections, sixty-nine chains.

Sections 101 to 106, inclusive, are towing path sections opposite the pool of the dam. The ground is quite favorable for making good and permanent sections of towing path. Whole length of those six towing path sections, two miles and seventy-four chains.

Sections 107 to 109, inclusive, extend from the site of the dam at the Horse race rifts, to the head of the Horse-shoe narrows. The ground is alluvial. The cutting varies from ten to nineteen feet. The surplus material coming out of this cut will be cast over the bank into the river. For some distance below the dam the towing path will be built in the river, and will be composed of heavy gravel, and

faced with a slope wall. The height of the towing path will be here twenty-three feet above the top of the mitre sill of the guard lock, and will have an inclination on the top corresponding with the surface of the highest freshets, and terminating at section one hundred and twenty-six. The whole length of those three sections will be seventy-two chains.

Sections 110 to 116, inclusive, are located at the Horse-shoe narrows, and by precipitous rocks for a considerable part of the distance. The canal will be built chiefly in the river. Some difficulty will be encountered here in procuring suitable materials for lining the canal. A portion of it may be obtained in the hill immediately adjoining the sections. The remainder will be transported from the flats adjoining the narrows, or across the river, as may be found most convenient. Suitable stone for wall is at hand, but will require blasting to quarry it. The aggregate length of those seven sections is two miles and thirty-five chains.

Sections 117 to 125, inclusive, are located on favorable ground, called the "Horse-shoe flats." The whole length of those nine sections, is three miles and fifty-four chains.

Sections 126 to 128, inclusive, are traced along the narrows by Tague's eddy. They will have to be protected with a wall. The stones for that purpose are convenient. The material for lining is not abundant. Whole length of those three sections, one mile and four chains.

Section 129 is located on the flat below Tague's run. Ground favorable. Length of this section, thirty chains.

Sections 130 to 133, inclusive, are located past the narrows above Tunkhannock village. They will require walling. Stone of good quality are abundant and at hand for that purpose, but will require blasting to quarry them. The material for lining is convenient. Whole length of those four sections, one mile and thirty-four chains.

Sections 134 to 138, inclusive, are traced through the flats past the village of Tunkhannock, and across the Tunkhannock creek. A few buildings will have to be moved in passing the village. The ground is favorable. The aggregate length of those five sections, is two miles and thirty-two chains.

Sections 139 to 141, inclusive, are located past the narrows below Tunkhannock. They will require walling throughout. The materials both for embankment and wall, are generally convenient. The public road will be occupied in making the canal, and a new road will be made in its stead at the same time with the canal. The aggregate length of those three sections, is one mile and thirteen chains.

Sections one hundred and forty-two to one hundred and forty-six inclusive, are traced over favorable ground, beginning near Kennedy's, and terminating near Osterhaut's. Aggregate length of these five sections, two miles and fifty chains.

Sections one hundred and forty-seven to one hundred and fifty, inclusive, begin at the head of the narrows below Osterhaut's, and terminate near Fitch's. They will require walling throughout, ex-

cept for a short distance at the head of the narrows. Stones for this purpose are convenient as well as material for lining. The public road will be taken up by the canal, and a new one will be made in connection with it. The whole length of those four sections is one mile and thirty-one chains.

Sections one hundred and fifty-one to one hundred and fifty-four are located on the flats, extending from Fitch's to the narrows below Taylor's. The ground is favorable throughout. Whole length of those four sections, two miles and two chains.

Sections one hundred and fifty-five to one hundred and fifty-six, are traced past the narrows above Roberts'. The rocks are precipitous for a part of the distance. The sections will require walling throughout. The public road will not be interfered with, to any great extent, in passing those narrows. The aggregate length of those two sections is fifty-one chains.

Sections one hundred and fifty-seven and one hundred and fifty-eight, are located through the flats on good ground for a canal. The whole length of those two sections is ninety-nine chains.

Sections one hundred and fifty-nine to one hundred and sixty-one, inclusive, are located past the narrows above Buttermilk Falls creek, and extend past the flat at the mouth of the stream, crossing the same. They will require walling for the whole distance. The public road will have to be changed for the same distance, and made on new ground above the canal. This may be done at once except at one point where for a short distance it will have to be made at the same time with the canal. A part of Seckler's house will have to be removed to make room for the canal. The whole distance embraced by those three sections is one mile and thirteen chains.

Sections one hundred and sixty-two to one hundred and sixty-four, inclusive, are traced along the narrows, below Buttermilk Falls creek. The whole will be protected with a wall. Stone of good quality are to be had in the neighborhood as well as good material for lining. The public road will have to be renewed at the same time that the canal is made. Whole length of those three sections, one mile and four chains.

Sections one hundred and sixty-five to one hundred and sixty-eight, inclusive, extend from the narrows below Buttermilk Creek to the head of the narrows below Elijah Harris's, over favorable ground. The aggregate length of those four sections is one and a half miles.

Sections one hundred and sixty-nine to one hundred and seventy-five, inclusive, are located past the narrows below Elijah Harris', and opposite Swan's tavern. Numbers one hundred and seventy-two to one hundred and seventy-five will require walling throughout. The present public road which will be destroyed in making the canal, will have to be renewed in connection with the other work. The material for the lining can be procured in the hill opposite the sections. Good stone for wall are also convenient. The whole length of those seven sections is two miles and thirty-eight chains.

Sections one hundred and seventy-six to one hundred and eighty-one, inclusive, are traced along the flats crossing Gardner's creek. The ground is favorable generally. At Gardner's creek a lengthy embankment will have to be made across the Valley of the stream. Whole length of those six sections, two miles and twenty-three chains.

Sections one hundred and eighty-two to one hundred and eighty-five inclusive, are located past the narrows by the Falling Spring.—The rocks are precipitous for a considerable part of the way. A large portion of the work will consist of solid rock excavation. The material for protection wall is abundant, but a part of the material for lining the sections will have to be transported from the flats above and below the narrows, or from the opposite side of the river. The public road to be occupied by the canal will have to be rebuilt as the canal is made, in connection with it. The aggregate length of those four sections is one mile and twenty-eight chains.

Sections one hundred and eighty-six to one hundred and eighty-nine, inclusive, extend across the flats from the Falling Spring narrows to the Wyoming canal near Bennet's house, crossing the Lackawanna creek. The ground for the most part of the distance is very favorable. A long embankment will be required to connect the aqueduct with the hill on the north west side of the flats. A good material for this work is at hand in the neighboring hill. A short embankment will also be required on the south east side of the Lackawanna creek, between the aqueduct and the Wyoming canal. It is proposed to form a junction with the Wyoming canal a short distance above the bridge at Bennet's house, and immediately opposite the ford at the Lackawanna.

The locks and aqueducts are numbered consecutively from Athens to Lackawanna. The following is a list of the locks, aqueducts, and culverts, on the Tunkhannock line with the lift of each lock, the length of the spans of each of the aqueducts, and the chords of the culverts.

LOCKS.

No. OF LOCK.	FALL.	WHERE LOCATED.
No. 14	9 feet,	Sec. 60, Wyalusing Flat.
15	6 "	71, near Wyalusing Falls.
16	10 "	80, Little Tuscarora creek.
17	7 "	88, Black Walnut bottom.
18	8 "	98, below Meshoppen creek.
19	10 "	100, on flat below creek.
20	13 "	100, Out-let lock into pool.
21	Guard lock.	107, Dam at Horse race.
22	do.	118, Horse Shoe Flat.
23	7 feet.	138, below Tunkhannock.
24	8 "	145, above Osterhaut's.
25	10 "	154, Taylor's Flat.
26	7 "	168, Elijah Harris'.
27	9 "	177, above Gardner's creek.
28	6 "	181, head of Falls, narrows.
29	5-5 "	189, E. of Lackawanna creek.
Whole lockage.	115-5	

AQUEDUCTS.

Aqueduct No. 4,	over	Big Tuscarora creek,	1	span		50	feet clear.
" 5,	"	Meshoppen creek,	3	"	each 60		"
" 6,	"	Tunkhannock creek,	3	"	" 75		"
" 7,	"	Buttermilk creek,	1	"	" 34		"
" 8,	"	Gardner's creek,	1	"	" 34		"
" 9,	"	Lackawanna creek,	3	"	" 75		"

CULVERTS.

Seven	Culverts,	4 feet chord each.	
Eight	"	6 do.	
Three	"	8 do.	
Four	"	10 do.	
Two	"	12 do.	
One	"	14 do.	
One	"	20 do.	Little Tuscarora.

There will be one dam only on this line. It is intended to be erected at the Horse Race rifts, forty-one and one-fourth miles below the dam at Towanda, and thirty-two and seven-eighth of a mile, above the junction with the Wyoming canal at Lackawanna. The head of the pool of the dam at the Horse Race will be thirty-eight and one-fourth miles below the dam at Towanda. The height of the dam at the Horse Race above low water mark will be six feet, and the length nine hundred feet between the abutments. A schute will be connec-

ted with the dam on the south western side of the river, where there is a favorable scite.

There will be ten public road bridges, fifty farm bridges, fourteen waste-weirs, fourteen lock houses, and sixteen thousand perches fence required on this line. It is estimated that eighteen thousand bushels of hydraulic cement will be required for the different stone structures in which that article is to be used. Castings will be required for the locks, aqueducts, bridges, wasteweirs, &c., to the amount of one hundred and forty thousand pounds. The cost of removing buildings from the line is estimated at seven thousand five hundred dollars.

The plans of the mechanical structures are designed to be the same with those described in my annual report of 1836, on the Tioga line respectively.

The whole estimated cost of the Tunkhannock line when completed, is two million fifty-three thousand nine hundred and fifty-one dollars and twenty-one cents.

The heaviest sections were prepared for contract in the months of May and June, as before stated, and were let on the thirty-first of July. It was not thought expedient to let any of the mechanical structures, as that part of the work can be completed as soon as the heaviest sections, if placed under contract early next season. The aggregate length of the sections placed under contract on the thirty-first July, is twenty-eight miles and twenty-eight chains; amounting agreeably to the estimate to one million four hundred thousand dollars. Most of the contractors are now prosecuting their respective jobs with a good force. For an account of the work done on each job I would refer the board to the tabular statements presented herewith. It amounted at the monthly estimate of October to the sum of sixteen thousand three hundred and twenty-two dollars.

TIOGA AND TUNKHANNOCK LINES.

The whole distance from the state line on the Susquehanna to the Wyoming canal, is ninety-four miles and twenty-nine chains. The distance from the State line on the Chemung to Athens, (four miles and twenty-two chains) added to this, makes the whole length of canal necessary to be constructed by Pennsylvania, to join the New York works effectively, ninety-eight miles and fifty-one chains. The estimated cost of accomplishing this, is three millions seven hundred and thirty-eight thousand nine hundred and eighty-two dollars and one cent.

I would respectfully recommend that the principal part of the remaining work, both on the Tioga and Tunkhannock lines, be placed under contract early next spring, as the whole of the heavy work should be progressing, the mechanical work, as well as the sections, particularly the stone work of the aqueducts, locks, culverts, and dams. Time is always important to contractors, and if let early the work can be done on better terms, than if hurried. Parts of the wood work may properly be delayed for some time, such as bridge super-

structures, lock gates, &c., but it will be well to provide the timber for such parts as require seasoning.

I would also respectfully urge the importance of an appropriation being made soon after the Legislature is convened, that the work on the whole line from Athens to Lackawanna, may progress regularly during the winter. It would be ruinous to most of the contractors to be obliged to part with their hands on the setting in of winter, a season of the year very favorable for working the heavy jobs, and it would be not less so to the laborer. To keep the whole line in active progress during the winter, the sum of five hundred thousand dollars is estimated as absolutely necessary to be provided in the month of December, and to meet the wants of the next summer and fall, the further sum of eight hundred thousand dollars is deemed not more than adequate to be appropriated to the whole work, between the state line and Wyoming. Those sums to be divided equally between the Tioga and Tunkhannock lines.

If the appropriations are made agreeably to this recommendation, the Tioga line may be completed by the spring of 1840, (with the exception of the work above Athens) and by the spring of 1841, the whole line of improvement may be completed between the state line and Lackawanna, (should the necessary funds be provided seasonably). This done, and the old lines below placed in perfect repair, and the highest and most sanguine calculations of the friends of this work will be more than realized in the revenue which will accrue to the state on this branch of the improvements; provided always that the state of New York completes the chain of canal, by connecting the Erie canal with our works, both by the Chemung and Susquehanna valleys, by the time that our canal is finished.

Respectfully submitted,

JAMES D. HARRIS, *Engineer.*

November 12*th*, 1838.

Report of James D. Harris, on Repairs.

To the Board of Canal Commissioners of Pennsylvania.

GENTLEMEN:—I have the honor to submit the following Report on the state of the finished lines of canal, in my charge.

SUSQUEHANNA DIVISION.

That portion of the canal between Duncan's Island, and Northumberland, is designated as the Susquehanna Division. It has been kept in good condition, generally, during the past season. In the early part of August, the water had fallen so low in the pool of the Shamokin Dam, as to occasion some difficulty in passing boats at a few points on the line below, but the supervisor was successful in furnishing the necessary supply, by throwing in a temporary dam of gravel, at the upper extremity of the main dam, and across the entrance of the schute, in the customary mode.

Proposals were received early in the last spring, for completing the repairs, necessary at the Shamokin Dam, for the purpose of tightening it, and the work was allotted, but was subsequently abandoned. The work was however commenced by the supervisor, and some progress has been made in it. The timber frame work has been completed for six hundred and fifty feet in length, and the frame has been filled with stone, and well secured to the old work, on which it rests with white oak pins, and iron bolts. The six inch plank covering has been put on a part of this section. A rise of the river has prevented the completion of it as yet, but it will be finished so soon as the state of the water will permit. The work so far as it has progressed, is believed to have been faithfully executed. It has been done under the direction of a foreman, appointed for the purpose of superintending the repairs of the dam.

During the last winter, the supervisor caused the canal to be deepened, between the middle creek aqueduct, and the first lift lock, which has given a better depth of water on that portion of it. It should be still farther improved in the same manner. The level below New Buffalo, will be rendered more secure by the construction of an ample wasteweir, now contemplated. The walls of two of the locks were partially taken down, and rebuilt immediately after the navigation was closed last fall; new lock gates were substituted in several of the locks, for such as were far decayed; substantial repairs have also been made at the aqueduct over Mahantongo, during the last winter.

The stone work as well as the superstructure of the aqueduct across middle creek is in such a state of delapidation as to need expensive repairs. The aqueduct is two hundred and eighty-eight

feet in length, between the abutments. The bottom of the trunk is thirteen and a half feet above low water of the creek. The superstructure is a wooden trunk, composed of string pieces, studs and plank, without a roof. The peirs are at the distance of thirty-seven feet apart, from centre to centre, some inconvenience is occasioned to boats passing the south eastern end of the aqueduct, owing to the abruptness of the curve. A further, and more particular examination will be necessary to determine the expediency or inexpediency of *rebuilding* the aqueduct on a new scite, contiguous to the present, but more favorable for the passage of boats, taking into view expense &c. The cost of rebuilding it on a new scite, is estimated at $15,000,00, and to repair it in a permanent manner on the present scite, will cost $6000,00.

Three of the farm bridges over the canal, on this division, will require renewal during the next season, and the towing path, abutment, and superstructure of a new public bridge will be built, at Liverpool, as directed by the board. The towing path, and road bridge at the ferry, opposite Sunbury, must also be rebuilt.

The following is an estimate of the repairs, necessary on the Susquehanna division within the next year.

Extraordinary Repairs.

For completing work at Shamokin dam,		$21,387 00
"	repairing aqueduct at Middle creek,	6,000 00
"	rebuilding two locks,	2,000 00
"	do. three farm bridges,	1,000 00
"	building bridge at Liverpool,	400 00
"	superstructure of do. opposite Sunbury	200 00
		$30,987 00

Note. The repairs of the Shamokin dam, was in my last Annual Report, estimated at $28,387 00, and on the supposition, that $7,000 of the work has been done, the amount yet necessary, is put at $21,387 00.

Ordinary Repairs.

For the renewal of lock gates,		$ 600 00
"	repairs of waste weirs,	500 00
"	deepening canal above first lift lock,	500 00
"	other repairs,	5000 00
		$6,600 00

North Branch Division.

This division embraces so much of the canal on the North Branch of the Susquehanna, as has been opened for navigation, and is comprehended between the forks at Northumberland, and the Lackawanna creek.

The only interruption to the navigation on this division, the last season was caused by two considerable breeches in the canal banks, and by the sudden fall of water in the river, in the month of August. The exertions of the supervisors were soon successful, in repairing the breeches, and in raising the water at the Nanticoke Dam, by the usual means of a temporary dam of gravel. A full supply was kept up during the business months of Autumn.

The repairs of the Nanticoke Dam, for the purpese of tightening it, were let early in the Spring, and the work is nearly completed.

In my annual report of 1836 on this part of the canal, I endeavored to set forth the necessity of prompt measures being taken for the repair of the locks below the Nanticoke Dam. The subject was again brought to the view of the board, in my last annual report, and an estimate was made of the amount necessary to *perfect* the whole canal, from Northumberland, to Lackawanna, including the re-erection of those locks. The whole amount stated, as necessary for this object, was $148,000 00 of which $80,000 00 were for renewing the locks, (eight including the guard lock at the Nanticoke Dam,) and $20,000 00 for building two extra guard or regulating locks, for the purpose of securing, and protecting the canal at a time of floods between the Nanticoke Dam, and Beach Grove, making $100,000 00 in all for the locks. Of this sum $40,000 00 were estimated as necessary the first season, and I would now respectfully represent, that this sum is needed to be applied in preparing materials, and boating them to the scites of the locks, within the next season, that the navigation may not be entirely stopped.

It will be sound economy to persue this course at once, for if the navigation is to be kept in order, either new locks must be built. or the old locks must be repaired very soon, and the sum which would be required to repair the old locks would go very far in constructing new, and substantial locks.

As early as 1835 the board of canal commissioners in their annual report, pressed the subject on the legislature in the following language, "eight of the locks on the North Branch Division were originally constructed entirely of wood. They are much decayed, and most of them will require to be replaced next season.

The sum of $2,000 00 will be required in rebuilding bridges next season.

I would respectfully refer the board to my report of last year, for a statement of the extraordinary repairs, to be made on the North Branch Division, some of those are not absolutely necessary at once, but all are necessary to perfect the work. The amount as was before stated to $148,000 00, from which the sum of $5,000 00, must now be deducted for the repairs of the Nanticoke Dam, which are now nearly completed.

The following is an estimate of the sums necessary for the repairs within next season on this division.

Extraordinary Repairs.

For rebuilding locks,	$40,000 00
do. bridges,	2,000 00
	$42,000 00

Ordinary Repairs.

For repairs of aqueducts, waste weirs, &c.	5,000 00
Deepening canal, facing banks, repairing guard gates, and for ordinary expenses,	7,000 00
Expenses of present year, yet due,	1,000 00
	$13,000 00

WEST BRANCH DIVISION.

This division of the canal begins at Northumberland, and extends up the valley of the West Branch to Lock Haven, and embraces the "Bald Eagle side cut."

With the exception of the interruption occasioned by a few inconsiderable breaches in the early part of the season, and by the extreme drought in the latter part of September and beginning of October, this division has been in good order since the opening of the navigation in the spring. It became necessary in the course of the season to tighten the dams, by gravelling, and to throw a temporary dam across the stream, at the Dunnsburg dam, as on the other divisions.

Some work has been done at the Bald Eagle dam, and at the Loyalsock dam, for the purpose of tightening and securing them. The repairs immediately necessary at the Muncy dam have also been completed.

As the enjoyment of the navigation of the canals is dependent entirely on the security of the dams, by which they are fed, I think it my duty to recommend that the Muncy dam, and the Dunnsburg dam be strengthened during the next season, by adding to them a crib on the lower side, to consist of large timber, strongly bolted together, and filled compactly with stone; forming a new breast to the dam at a flat slope, tending to reduce the reaction. A crib of this kind was sunk last year below the dam at Dunnsburg, for the distance of 240 feet, at the south end, where the trough produced by the reaction was deepest, leaving 590 feet yet to be done. In making the repairs at the Muncy dam, the bottom section of a similar crib was sunk in the trough for 200 feet in length, adjoining the dam, and paved with large stones, at the surface of the water. This serves as a temporary security, and will constitute a part of the permanent repair recommended.

Both the Muncy and Dunnsburg dams stand on a gravel foundation, and as they are the walls of the great magazines, from which

ıe supplies for the canals are drawn, it is wise to keep a very watch-
ıl eye over them, and to apply effective remedies on the least ap-
ɛarance of failure. I have examined their structures carefully dur-
g the low stage of the water, and my opinion is, that it would be a
ise precausion to complete the cribs in front next season, after which
ıey may be regarded as permanent. The troughing has progressed
such depth, as to give an opportunity to make a permanent work.
he cost of completing the breast of the Dunnsburg dam, is estima-
d at $15,000 00, and for that at Muncy dam, the sum of $18,000
) is estimated sufficient. Both of these items should be termed
extraordinary repairs."

The following is an estimate of the repairs necessary on the West
anch division, within the next year.

EXTRAORDINARY REPAIRS.

r extension of breast of dam at Dunnsburg,	15,000 00
do. do. Muncy dam,	18,000 00
Rebuilding culvert at Halls farm,	1,200 00
Building a guard gate at Loyalsock, or for extending the weir of the dam,	2,000 00
Building a new bridge at Milton,	1,000 00
Rebuilding other bridges,	600 00
	$37,800 00

ORDINARY REPAIRS.

r riprapping canal banks,	1,000 00
Lining banks, excavating bottom, and other ordinary expenses,	12,300 00
Wells, and ovens at two locks,	200 00
	$13,500 00

GENERAL ABSTRACT OF REPAIRS.

	Extraordinary,	Ordinary.
quehanna division,	30,987 00	6,600 00
rth Branch,	42,000 00	13,000 00
st Branch	37,800 00	13,500 00
	110,787 00	33,100 00
		110,787 00
Total Amt.		$143,887 00

The attention of the supervisors should be directed early in each season, to the removal of the grass, which has in some instances so obstructed the passage of the water in the canal, as to prevent the necessary supply from reaching the lower levels, without reducing the depth in the higher levels too low for boating.

Notwithstanding the annual demands on the Treasury for repairs are heavy, it is matter of encouragement to be able to state, that the trunk of our canal is daily gaining permanency, and that with the lapse of time, the prospect for a great diminution in the annual expense is well grounded. Experience shows that repairs when made should be well done, and if so, the annual charges will be in the end comparatively small, whilst the trade, and the ability to pay for the repairs is constantly augmenting. Under a wise, and liberal policy, dictated by enlarged and correct views of the resources of the State; canals have been constructed at the expense of the Commonwealth, up the Susquehanna, from Duncan's to Northumberlad; and thence up both branches of the Susquehanna—one arm of the improvements extending to the anthracite coal region on the north, the other grasping the bituminous mines of the West Branch. That the state may derive all the benefit from her outlay in those works to which she is entitled, it is clearly her interest to have them perfected, and kept in good repair. This is necessary to give confidence to transporters, and to encourage the investment of capital in mines, and manufactories, all tending to augment the tonnage, and tolls on the canals.

Respectfully submitted,

JAMES D. HARRIS.

Engineer.

November 12th 1838.

Report of Charles T. Whippo, Erie Extension.

To Thaddeus Stevens, Esq.

President of the Board of Canal Commissioners.

Sir:—The undersigned herewith presents his annual report of the different lines of canal under his care, viz: The Beaver, the Erie extension, and the French Creek divisions of the Pennsylvania canal.

Beaver division is thirty and three-fourth miles long, 227 slack-water and 805 canal, lockage 132 feet.

In my report of last season, in relation to this line, I made an estimate of the cost of putting it in complete repair. The Legislature however, only appropriated as much as was *absolutely* necessary to preserve the locks and dams. Being thus limited very little work has been done during the past season—as much about as would balance the damage done by floods, &c. since my last report, so that the estimate therein submitted, may be taken with very little alterations for the ensuing year, and may be set down as follows:

ESTIMATE.

Towing path above New Castle along Shenango pool,	$1,000 00
Aqueduct No. 1,	1,712 00
Locks Nos. 1, 2, and 3, $100 each,	300 00
Lock No. 4,	2,750 00
" " 5,	700 00
" " 6,	100 00
" " 7,	1,910 00
Repairing canal and tow path from New Castle to lock 7, eight miles, at $300 per mile,	2,400 00
Dam No. 2,	3,000 00
Dam No. 3,	1,800 00
Towing path bridge over Connoquenessing,	1,740 00
Raising tow path between dams No. 3 and No. 4,	7,000 00
Raising dam No. 4 at Dr. Adams',	6,260 00
Repairing dam No. 5, at Brighton,	1,600 00
Repairing lock Nos. 9, 10 and 11,	300 00
Raising and repairing towing path above dam No. 6,	2,140 00
Repairing dam No. 6,	200 00
Locks Nos. 16 and 17,	5,660 00
Total cost of repairing line,	$40,572 00

This includes every thing except the bridge over the Shenango at New Castle, an appropriation to which was provided by the Legislature of last winter, and the work is now under contract and in progress.

There is now very strong and urgent reasons why this line of improvement should be repaired and made navigable as early as practicable.

If an early appropriation should be made next winter to the Erie extension, the whole line put under contract in 1836, a distance of forty-five and a half miles, may be completed by the middle of September next; and in visiting the Pennsylvania and Ohio canal a few days ago, I am happy to be able to inform the board that I found that work in a much more advanced state than I had expected. I am not able to lay before the board the particular state of the work, but I have no hesitation in saying that it is two-thirds done; and if the company should not be disappointed in raising the requisite funds for completion in the early part of the winter, and there is now every reason to believe they will not, I do not see why this work may not be ready for navigation, as early as that part of the Erie extension just referred to.

When these two lines of improvement are completed and ready for navigation, it is evident that the Beaver division may at once become an important thoroughfare, as it is the connecting link between them and our State improvements east.

The Pennsylvania and Ohio canal, which connects with the Beaver division a little below New Castle, with the Ohio canal at Akron, and through this with the lakes at Cleveland is an important communication for Pennsylvania. It passes through a rich and populous country, and connecting as it does with the lake at a point which is open and free from ice, so much earlier in the spring and later in the fall than at Buffaloe, or even at Erie, it will have a decided advantage over both the New York canal and the Erie extension, during these two important seasons of the year; and as the distance to an eastern market is not greater than by one of these routes, and is considerably less than by the other, a very large amount of business may undoubtedly be done through it. But if the Beaver division should remain as it now is, after this communication is open, this business will be lost and the tolls which would arise from it would also be lost, not only on the Beaver division, but the whole Pennsylvania improvements to Philadelphia.

The Erie extension will bring in the trade of the whole Shenango Valley, which is now very important and is rapidly increasing.

For further particulars see my report of last year.

ERIE EXTENSION.

Under this head is comprehended the whole line of canal and slackwater from the head of the pool, six miles above New Castle, to the harbour of Erie. It is divided into two principal divisions, viz: Shenango line and Conneaut line.

The Shenango line commences at the head of the pool, six miles above New Castle, and extends along up the Shenango valley to the mouth of Crooked creek, thence by Crooked creek valley, the Pymatuning swamp and Beaver dam summit, to the termination of the French creek feeder at the outlet of Conneaut lake. This line is sub-divided into two divisions, viz. line put under contract in 1836 and line put under contract in 1838.

The Conneaut line commences on the Shenango line near the Beaver dam summit, thence by the Conneaut summit, the Conneaut valley, Cranesville, Hall's run, Girard, &c. &c. to the harbour of Erie at the town of Erie.

SHENANGO LINE.

The part put under contract in 1836.

This line has been particularly described in my two preceding reports, which makes it unnecessary to add any thing further upon this subject. In order, however, to save the necessity of referring to these reports, I will mention that the length is forty-five and a half miles—lockage 175½ feet.

In the following tables you have the cost of work done, cost of work to be done, and total cost. By these you will perceive that the work is about two thirds done; and had it been possible at any reasonable compensation to obtain more hands it might now have been much more advanced. Should the Legislature make early appropriation this winter, so that the contractors can have some assurance that the work will be continued, I see nothing to prevent the completion of this line by the middle of September next, unless the weather should be more unfavorable than it has been during the last season.

Upon this line we have cut stone locks which we require to be built in the most substantial manner. The beds and joints of the stone ard cut *full* to the square. The faces are axed off smooth, or picked as the contractor may prefer, and they are all laid with great care, and the wall thoroughly grouted with hydraulic cement.

When we first commenced building locks upon this line, we supposed from the external appearance of the quarries, that we were going to have an abundance of excellent stone. But in this we have been very much deceived. When the quarries were opened the stone were found, in many instances, shelly and defective, and in others they run out and failed altogether. This has been one principal cause of the great number of re-lettings of locks and the high prices we have been compelled to pay for them.

At one of our lettings this season, (that on the 10th April, at which we let locks Nos. 6 and 13,) perceiving that our stone locks were costing us so very much, I determined to receive bids for the combined plan as well as the stone with a view of determining the difference of cost. The plan of the combined lock was made as simple as possible. The body of the lock was to be laid up in ruble

masonry without mortar or grout. The quoins and coping were to be cut, and the inside of the lock lined with plank. Every pains was taken to make the contractors understand the plan and to induce them to bid for the locks upon it; but after all I believe we only received three propositions from responsible persons, by which it appeared the sixth lock could have been built for about $3000, and the thirteenth about $2000 less than upon the entire cut plan. I submitted this result to the board immediately after the letting, and they determined to have the work done upon the cut stone plan.

You will perceive, however, by referring to the tabular statement abovementioned, that very little has been done upon either of them. This has been caused altogether by the stone being so remote and so difficult to obtain, so that these two locks must be expensive unless we construct them entirely of wood.

I say nothing in regard to the progress of the work, because the tabular statements shew that more fully and definitely than it could be done any other way.

STATEMENT

Showing the cost of work done, cost of work to be done, and the total estimated cost on the Shenango line put under contract in 1836.

SECTIONS.

Sect.	Cost of work done.	Cost of work to be done.	Total cost.	REMARKS.
1	4,622 60	629 00	5,251 00	Head of slack-water, six miles above New Castle,
2	9,092 00	2,044 00	11,136 00	Canal partly in river,
3	3,136 00	1,904 00	5,040 00	
4	7,434 67		7,434 67	Canal partly in river—final estimate paid,
5	5,350 00	2,631 00	7,981 00	" "
6	5,059 90		5,059 90	Pulaski—final estimate made,
7	13,167 00	1,927 00	15,094 00	Canal partly in river,
8	9,612 00	1,345 00	10,957 00	" "
9	4,563 00	400 00	4,963 00	
10	9,294 00	2,412 00	11,706 00	Canal partly in river,
11	7,815 00	1,256 00	9,071 00	" " Middlesex,
12	3,683 00	1,044 00	4,727 00	
13	7,067 00	344 00	7,411 00	
14	4,379 00	2,850 00	7,229 00	
15	4,029 00	831 00	4,860 00	
16	7,437 00	996 00	8,433 00	Canal partly in river,
17	6,572 00	1,063 00	7,635 00	" " town of Sharon,

18	7,373 02		7,373 02	Final estimate,
19	7,477 00	8,663 00	16,140 00	Difficult work—canal partly in river,
20	10,983 00	6,155 00	17,138 00	Sharp's mills,
21	5,178 06	817 00	5,995 00	Dam No. 1—slack-water,
22	3,124 00	672 00	3,796 00	"
23	3,001 20		3,001 20	Final estimate paid,
24	13,395 00	4,392 00	17,787 00	This section crosses the river four times, and this estimate includes three culverts and one waste-weir,
25	9,348 00	2,088 00	11,436 00	
26	15,238 24		15,238 24	Finished on second contract,
27	7,284 00	1,959 00	9,243 00	
28	5,442 13		5,442 13	Final estimate,
29	4,965 00	223 00	5,188 00	
30	5,450 40		5,450 40	Finished including one culvert,
31	5,126 55		5,126 55	Finished by original contractor,
32	6,922 00	2,913 00	9,835 00	Including towing-path bridge and four culverts,
33	7,986 00	1,319 00	9,305 00	" " " "
34	5,917 76		5,917 76	Finished by original contractor,
35	11,291 00	3,570 00	14,861 00	Canal partly in the river,
36	4,831 00	1,850 00	6,681 00	
37	5,637 92		5,637 92	Finished by original contractor,
38	12,303 11		12,303 11	" " "
39	5,790 86		5,790 86	" second "
40	7,961 78		7,961 78	" original "
41	9,210 74		9,210 74	" second "
42	8,047 90		8,047 90	" original "
43	6,790 16		6,790 16	" " "
44	3,932 36		3,932 36	" second "
45	5,215 28		5,215 28	" original "

SECTIONS—Continued.

Sect.	Cost of work done.	Cost of work to be done.	Total cost of work.	REMARKS.
46	1,886 33		1,886 33	Finished by original contractor.
47	4,965 83		4,965 83	do. do. do.
	$324,387 90	$56,297 00	$380,684 90	

LOCKS.

lo'ks	Cost of work done.	Cost of work to be done.	Total cost of work.	REMARKS.
1	$13,175 35		$13,175 35	Final—Head of pool above N. Castle.
2	4,959 00	$9,831 00	14,790 00	
3	6,582 00	7,108 00	13,690 00	
4	6,868 00	7,904 00	14,772 00	
5	3,479 00	12,511 00	15,990 00	
6	1,411 00	15,731 00	17,142 00	Very difficult, no stone nearer than four miles.
7	5,967 0	8,943 00	14,910 00	
8	9,896 00	4,044 00	13,940 00	
9	9,629 00	4,562 00	14,191 00	

10	$8,160 00	5,624 00	13,784 00	Dam No. 1, near Sharp's Mill,
11	9,149 00	8,677 00	17,826 00	Out-let lock, mouth of Pymatuning,
12	10,071 00	2,045 00	12,116 00	Clarksville,
13	452 00	14,675 00	15,127 00	Stone very difficult to obtain,
14	11,958 00	1,491 00	13,449 00	
15	4,480 00	12,429 00	16,909 00	Upper end of pool of dam No. 2,
16	10,546 76		10,546 76	Final estimate,
17	6,358 00	5,835 00	12,193 00	
18	11,520 00	985 00	12,505 00	
19	9,368 00	3,841 00	13,209 00	
20	3,141 00	9,489 00	12,630 00	
21	10,242 00	6,778 00	17,020 00	Guard lock at Greenville,
22	11,816 00		11,816 00	
23	6,108 00	5,629 00	11,737 00	
24	13,156 52		13,156 52	Final estimate,
25	15,933 00	832 00	16,765 00	
26	7,632 00	6,228 00	13,860 00	
		*3,500 00	3,500 00	For driving piles lock No. 26.
	$212,057 63	$158,692 00	$370,749 63	

* The foundation of Lock No. 26, is a species of fine blue clay, bordering on quicksand; and we shall be obliged to drive piles extensively in order to secure it.

DAMS.

dams	Cost of work done.	Cost of work to be done.	Total cost.	REMARKS.
1	$6,695 00	$4,205 00	$10,900 00	Near Sharp's Mills,
2	4,966 00	10,768 00	15,734 00	Big bend of Shenango river,
3	5,899 00	802 00	6,701 0	Greenville,
4	13,068 00	494 00	13,562 00	Loutzenhizer's,
5	3,045 00	3,360 00	6,405 00	Williamson's Mills.
	33,673 00	19,629 00	53,302 00	

AQUEDUCTS.

Aqueducts	Cost of work done.	Cost of work to be done.	Total cost.	REMARKS.
1	$1,459 61	$2,428 25	$6,887 86	Piper's run,
2	8,610 00	1,327 00	9,937 00	Anderson's run,
3	7,196 00	2,238 00	9,434 00	Sawmill run,
	20,265 61	5,993 25	26,258 86	

Items of work.	Cost of work done.	Cost of work to be done	Total cost of work,	REMARKS.
19 Waste weirs,	$8,144 00	$18,625 00	$26,769 00	
6 Tow path bridges,	2,153 00	3,973 00	6,126 00	
12 Road bridges,	7,071 00	14,544 00	21,615 00	
46 Farm bridges,	641 00	24,759 00	25,400 00	
24 Lock houses,	3,582 00	12,000 00	15,582 00	
2 Culverts,		600 00	600 00	
Fence,	2,966 26	3,033 74	6,000 00	

RECAPITULATION.

Items of work.	Cost of work done.	Cost of work to be done.	Total cost of work.
47 Sections,	324,387 90	56,297 00	380,684 90
26 Locks,	212,057 63	158,692 00	370,749 63
5 Dams,	33,673 00	19,629 00	53,302 00
3 Aqueducts,	20,265 61	5,993 25	26,258 86
19 Waste-weirs,	8,144 00	18,625 00	26,769 00
6 Towing-path bridges,	2,153 00	3,973 00	6,126 00
12 Road bridges,	7,071 00	14,544 00	21,615 00
46 Farm bridges,	641 00	24,759 00	25,400 00
24 Lock-houses,	3,582 00	12,000 00	15,582 00
2 Culverts,		600 00	600 00
Fence,	2,966 26	3,033 74	6,000 00
	614,941 40	318,145 99	933,087 39
Add for superintendence and contingencies,		54,635 95	54,635 90
		372,781 94	987,723 34

LINE PUT UNDER CONTRACT IN 1838.

This line was located in 1836, and particularly described in my report of that year. It commences at the mouth of Crooked creek, and extends up through the valley of that stream, by Owrystown, Hartstown, Pymatuning swamp, Beaver dam summit, to the termination of the French creek feeder at the outlet of Conneaut lake. This line is favorable for the construction of a canal, except the Beaver dam summit, and from thence to its termination, about 4 miles, nearly the whole of which distance is deep cutting or swamp. At Hartstown, we have a reservoir containing upwards of 400 acres, embracing nearly the whole southern portion of the Pymatuning swamp.

This reservoir will be ten feet deep above the bottom of canal, giving us six feet of available water, and will be of vast importance in supplying the lower portion of canal during dry seasons.

At Conneaut lake, we also have an extensive reservoir. The surface of the lake is to be raised eleven feet, or seven feet above bottom of canal; which enables us to draw off three feet, for the purpose of supplying the Conneaut and Shenango lines of canal during scarce times of water. To effect this object, we are obliged to raise the banks of the French creek feeder, 1½ feet on an average for the distance of 12 miles.

It will be recollected that there is descent in the bottom of this feeder of 3 inches in a mile; at the end of the 12 miles, therefore, the water will be about 4 feet deep, while at the reservoir it will be 7 feet deep. In this way the capacity of the reservoir will be very considerably increased, and the expense of raising the banks very trifling compared with the importance of the object to be gained by it.—should it ever be found necessary, this plan can be adopted on the whole line. The banks can be raised to any required height, and the capacity of the feeder increased proportionably. But should this be done, it would be necessary to raise the dam also; and I would recommend to have it raised in any event, or rather, I would have the dam so constructed as that an additional height, say of three feet, could hereafter be added to it, in case it should be required.

This might be important in another point of view. The feeder, as it now is, with a good deal of sediment in its bottom, and very considerably narrowed by hill slips and gravel bars, has not sufficient capacity to send down the requisite quantity of water for feeding, without causing such a current as greatly to injure its navigation, if not to impede it altogether. By raising the banks and the feeder dam, as above suggested, this difficulty might be effectually obviated; and I question whether the expense would be as great, as

by the plan of removing the hill slips, &c., which would otherwise have to be done,

The reservoir at Conneaut lake will contain acres and cubic feet of water over and above what will be required for the summit level itself. This will be sufficient to supply the Conneaut and Shenango lines for a term of days, admitting boats to pass each way over the summit every day, without any other aid; so that during all the dry season of the year, I do not anticipate that it will ever be necessary to draw any water from French creek, except to keep up the navigation of the feeder, and the Franklin line. All that will be necessary, will be to take care that the reservoir is filled at the time the drought commences.

In order to prevent sickness about this reservoir it is proposed to clear the timber off of all the land which will be overflowed. It will then present one of the largest and most beautiful sheets of water to be found in Pennsylvania. Several sections of the clearing, which were let out in September last, are in rapid progress. A large portion of the lands which will be overflowed are now an irredeemable swamp. Those on the eastern side and northern end, however, are good, and a considerable amount of damage will have to be paid for them.

It will be seen by an examination of our tabular statement, that very little work has been done upon this line up to this date. Many of the contractors were slow in commencing work. Much time was taken up in building shantees and procuring the necessary implemens. Having this all done they are now going on briskly, and a considerable amount of work will be done before the winter sets in.

STATEMENT

Showing the cost of work done, cost of work to be done, and the total estimated cost on Shenango line put under contract in 1838.

SECTIONS.

Stations.	Cost of work done.	Cost of work to be done.	Total cost.	Length.	REMARKS.
No. 48	$839 00	$3,379 50	$4,218 50	11 station	
49		3,379 54	3,379 54	12	
50	271 00	2,843 00	3,114 00	12	
51	302 00	3,107 00	3,409 00	12	
52		3,740 00	3,740 00	12	
53	842 00	2,592 80	3,434 80	12	
54	300 00	4,067 40	4,367 40	12	
55	1,122 00	3,947 98	5,069 98	12	
56	400 00	2,737 44	3,137 44	12	
57	394 00	3,887 00	4,281 00	12	Owrystown.
58	316 00	2,360 00	2,676 10	12	
59	50 00	3,501 68	3,551 68	12	
60		3,351 00	3,351 00	12	
61	292 00	2,876 84	3,168 84	12	
62	359 00	5,876 08	6,235 08	16	
63	590 00	6,695 30	7,285 30	18	Hartstown.
64	20 00	8,832 60	8,852 60	12	Pymatuning reservoir.

65	656 00	10,528 68	11,184 68	12	do do
66		13,600 12	13,600 12	12	do do
67		7,349 88	7,349 88	12	do do
68		6,930 64	6,930 64	12	
69		6,265 30	6,265 30	12	
70		7,569 80	7,569 80	14	
71	373 00	3,239 00	3,612 00	10	
72	519 00	4,868 74	5,387 74	12	
73	401 00	3,479 16	3,880 16	12	
74	121 00	3,947 20	4,068 20	12	
75	173 00	3,295 48	3,468 48	12	
76	360 00	23,940 00	24,300 00	8	Beaver dam summit.
77	136 00	21,339 00	21,475 00	10	do do
78	2,100 00	7,969 00	10,069 00	11	
79	880 00	8,904 00	9,784 00	15	Conneaut lake reservoir.
80	683 00	8,407 00	9,090 00	15	do do
81	503 00	13,787 00	14,290 00	15	do do
82	822 00	8,518 00	9,040 00	15	do do
83	2,406 00	4,794 00	7,200 00	15	do do
84	631 00	5,767 20	6,398 20	12	French creek feeder.
	$16 861 00	$241.874 46	$258,535 44	451	Total cost of sections.

Number of locks.	Lift and guard.	Cost of work done.	Cost of work to be done.	Total Cost.	Remarks.
No. 27	$6\frac{5}{8}$ feet lift		$11,990 00	$11,990 00	Cut Stone.
28	$6\frac{5}{8}$	$195 00	11,795 00	11,990 00	do do
29	$6\frac{5}{8}$		11,990 00	11,990 00	do do
30	$6\frac{5}{8}$	214 00	11,776 00	11,990 00	do do
31	$6\frac{5}{8}$	234 00	11,756 00	11,990 00	do do
32	$6\frac{5}{8}$	50 00	11,940 00	11,990 00	do do
33	$6\frac{5}{8}$		11,990 00	11,990 00	do do
34	$6\frac{5}{8}$		11,990 00	11,990 00	do do
35	$6\frac{1}{2}$ guard	1,261 00	10,729 00	11,990 00	do do
36	$6\frac{1}{4}$ lift	95 00	9,269 25	9,364 25	Combined Plan.
37	$6\frac{1}{4}$	40 00	9,324 25	9,364 25	do do
38	$6\frac{1}{2}$	216 00	9,148 25	9,364 25	do do
39	$6\frac{1}{2}$	139 00	9,225 25	9,364 25	do do
40	$6\frac{1}{2}$	140 00	9,224 25	9,364 25	do do
41	$6\frac{1}{2}$	101 00	9,263 25	9,364 25	do do
42	$6\frac{1}{2}$	1,982 00	7,382 25	9,364 25	do do
43	$6\frac{1}{2}$	291 00	9,073 25	9,364 25	do do
44	4ft. lift. 3ft. g'd.	101 00	9,263 25	9,364 25	do do
		$5,059 00	$187,129 25	$192,188 25	Total cost of Locks.

ESTIMATE OF OTHER WORK.

18 Waste weirs at	$1,500 00 each,	$27,000 00
30 Farm bridges at	500 00 "	15,000 00
18 lock house, at	800 00	14,400 00
6 Road do at	600 00 "	3,600 00
4500 perches fence at	50 cents,	2,250 00
1800 acres Conneaut reservoir, at	40 00	72,000 00

RECAPITULATION.

Items of Work.	Cost of work done.	Cost of work to be done.	Total cost of work.
37 Sections	$16,761 00	$241,674 46	$258,535 46
18 Locks,	5,059 00	187,129 25	192,188 25
18 Weirs,		27,000 00	27,000 00
30 Farm bridges,		15,000 00	15,000 00
6 Road do		3,600 00	3,600 00
18 Lock Houses,		14,400 00	14,400 00
4500 perches fence,		2,250 00	2,250 00
Conneaut reservoir,		72,000 00	72,000 00
	$21,920 00	$563,053 71	$584,973 71
Add for superintendance, &c.,		58,497 37	58,497 37
		$621,551 08	$643,471 08

CONNEAUT LINE.

This line commences as before stated at the Shenango line near the Beaver dam summit. It has heretofore been called the western route, and under this name was surveyed and reported upon by me in 1836.

Its length is 45. 4 miles—lockage 509. 38 feet—11. 55 miles of this line was put under contract in July last, together with thirteen locks. The locks have all been abandoned except three. The sections are all in progress except two, and some of them, as the board will perceive by the tabular statement, have been prosecuted with great energy.

I have given two tabular statements. One showing the cost of work done, the cost of work to be done, and the total cost of the work put under contract in 1838. The other shows the estimated cost of the whole line, including the work under contract.

The sections under contract contain all the difficult portions upon the line. That at Conneaut summit is very difficult on account of the depth of the cutting—the water, (which cannot be conveniently drained off) and the nature of the soil, which is in some places clayey and inclined to slip. So far, however, we have not come into any quicksand.

The heavy embankments at east branch of Conneaut, at Elk and Walnut creeks, will be attended with great expense. These streams are subject to remarkably high floods, and we are obliged to make correspondingly large culverts. Fortunately the stone for these structures can be found within a reasonable distance of the work.

The mason work is to be laid up in the most substantial manner, and grouted with Hydraulic cement, an abundance of which can be obtained from the State of New York, of an excellent quality and at reasonable expense.

Our locks, from the upper end of the line to the lower end of the Conneaut valley, I propose to make upon the combined plan—the walls to be laid up in substantial ruble masonry, without mortar or grout, the quoins and coping to be wood and the inside of the lock to be lined with plank. So far I have no doubt we shall find stone enough for this purpose, but between this and Erie they are very scarce, and will cost so much that I am inclined to think we had better construct the locks entirely of wood. These will last eight or ten years, and in the mean time stone can be procured by water at a moderate expense for new ones.

The wooden lock, if well made, is a good working lock, and answers as well while it lasts as any other kind. It also has the advantage of being cheap and easily and cheaply repaired. All the lower timbers, which will be covered with water, will remain sound

for a very long time; and the lock should be so constructed as that these need not be disturbed in order to replace the upper ones. This can easily be done, so that while timber remains abundant it may be good policy to defer building the stone locks and continue to repair the wooden ones.

My estimate for the wooden locks, I feel confident, will be sufficient to make them. Upon the combined, or cut stone plan, it would be difficult to make an estimate, as there is no certainty as yet as to the extent of the quarries or the cost of working them. To go up the lake after stone would involve an expense wholly unwarrantable.

I wish it to be understood that the estimates are intended to cover merely the cost of the work and superintendence, and not to include any thing for damage, removing of buildings, or any thing of that kind.

It will be perceived that we have run our level to seven and a half feet below the surface of lake Erie. This was done on account of the lake being about three feet higher than ordinary low water mark. It is now, I am told, falling again, and is about a foot and a half lower than when our survey was made.

STATEMENT,

Showing the estimated cost of sections on the Conneaut line of the Erie Extension, Pennsylvania Canal.

No.	Length.	Cost.	Remarks.
1	12 stations	$10,132 50	Connects with Shenango line.
2	12	16,212 40	
3	12	19,962 40	
4	12	30,635 20	Conneaut Summit,
5	12	27,254 00	do do
6	24	7,745 32	In valley of Conneaut creek.
7	24	9,206 30	do do
8	24	8,015 58	do do
9	24	6,800 58	do do
10	24	8,502 46	do do
11	18	4,105 16	Through Conneautville.
12	30	9,999 06	In valley of Conneaut creek.
13	24	8,131 60	do do do
14	22	9,381 76	do do do
15	26	8,852 60	do do do
16	24	7,771 44	do Passes Marion village.
17	24	9,302 22	do do do
18	24	6,723 22	do do do
19	24	7,148 64	do do do
20	12	8,400 00	Crosses Cole's run.

21	16	$5,601 98	
22	17	9,520 00	Crosses Maxwell's run; under contract.
23	19	6,313 12	
24	17	6,544 26	
25	11	5,585 00	Crosses Jackson's run; under contract.
26	12	3,744 56	
27	12	16,145 00	Crosses east branch of Conneaut; under contract.
28	20	8,267 32	
29	20	8,687 85	
30	24	7,495 98	
31	24	6,460 80	To head of Packsaddle run.
32	44	17,011 42	In Hall's run valley; fourteen locks on it.
33	12	15,346 00	do do
34	14	9,428 16	
35	9	58,220 00	Crossing Elk creek.
36	11	13,538 64	
37	10	13,518 40	
38	10	10,871 30	
39	11	25,100 00	Deep cut through Girard village.
40	11	14,715 36	do do do
41	20	5,112 48	In Haggerty's run.
42	20	5,122 86	
43	20	4,132 94	
44	19	5,694 80	
45	12	8,010 92	Trout run.
46	19	5,556 50	
47	18	4 390 30	
48	18	4,595 54	

ESTIMATE OF SECTIONS—Continued.

No.	Length.	Cost.	Remarks.
49	12 stations	$75,275 00	Crossing Walnut creek.
50	18	5,177 74	
51	18	4,633 42	
52	18	4,516 52	
53	18	5,932 54	
54	18	4,895 14	
55	18	5,974 74	
56	18	4,133 00	
57	18	5,214 74	
58	18	5,260 00	
59	10	3,842 02	Cascade run.
60	12	4,489 00	
61	13	4,676 00	To head of Navy Yard run.
62	28	8,478 76	To the Harbor of Erie.
Total 1110		$671,563 55	Total cost of sections.

descent or bottom on the long levels of 1.68 feet.

ESTIMATE OF SECTIONS—Continued.

No.	Length.	Cost.	Remarks.
49	12 stations	$75,275 00	Crossing Walnut creek.
50	18	5,177 74	
51	18	4,633 42	
52	18	4,516 52	
53	18	5,932 54	
54	18	4,895 14	
55	18	5.974 74	
56	18	4,133 00	
57	18	5,214 74	
58	18	5,260 00	
59	10	3,842 02	Cascade run.
60	12	4,489 00	
61	13	4,676 00	To head of Navy Yard run.
62	28	8,478 76	To the Harbor of Erie.
Total 1110		$671,563 55	Total cost of sections.

Showing the estimated cost of locks on the Conneaut line, of the Erie extension, Pennsylvania Canal.

No.	Lift and guard.	Description.	Cost.	REMARKS.
1	4 ft. lift & 3 ft. guard,	Combined.	$9,420 45	In Conneaut Valley.
2	6.6 ft. lift.	"	9,420 45	"
3	6.6	"	9,420 45	"
4	6.6	"	9,420 45	"
5	6.6	"	9,420 45	"
6	6.6	"	9,420 45	"
7	6.6	"	9,420 45	"
8	6.6	"	9,420 45	"
9	6.6	"	9,420 45	"
10	6.6	"	9,420 45	"
11	6.6	"	9,420 45	"
12	6.6	"	9,420 45	"
13	6.6	"	9,420 45	"
14	6.6	"	9,420 45	"
15	6.6	"	9,420 45	"
16	6.6	"	9,420 45	"
17	6.6	"	9,420 45	"
18	6.6	"	9,420 45	"
19	6.6	"	9,420 45	"
20	6.6	"	9,420 45	In Conneautville, under contract.
21	6.6	"	9,420 45	"
22	6.6	"	9,420 45	"
23	6.6	"	9,420 45	In Conneaut valley,
24	6.6	"	9,420 45	"
25	6.6	"	9,420 45	"
26	6.6	"	9,420 45	"
27	6.5	"	9,420 45	"
28	6.5	Of wood.	5,879 00	Near the head of Hall's run.
29	7.0	"	9,420 45	"
30	7.0	"	5,879 00	"
31	7.0	"	5,879 00	In Hall's run.
32	7.0	"	5,879 00	"
33	7.0	"	5,879 00	"
34	7.0	"	5,879 00	"
35	7.0	"	5,879 00	"
36	7.0	"	5,879 00	"
37	7.0	"	5,879 00	"
38	7.0	"	5,879 00	"
39	7.0	"	5,879 00	"
40	7.0	"	5,879 00	"
41	7.0	"	5,879 00	"
42	7.0	"	5,879 00	"
43	7.0	"	5,879 00	"
44	7.0	"	5,879 00	"
45	7.0	"	5,879 00	"
46	7.0	"	5,879 00	"
47	7.0	"	5,879 00	"
48	7.0	"	5,879 00	"
49	7.0	"	5,879 00	In Haggerty's run,
50	7.0	"	5,879 00	"
51	7.0	"	5,879 00	"
52	6.5	"	5,879 00	On section No. 55, near M'Creery's.
53	7.0	"	5,879 00	"
54	7.0	"	5,879 00	On Poor House farm
55	7.0	"	5,879 00	At the Cascade run.
56	7.0	"	5,879 00	"
57	7.0	"	5,879 00	"

	$177,649 50	Total cost of culverts.

ESTIMATED COST OF OTHER WORK, viz:

45 waste-weirs at	$1,500 each,	$67,500 00
50 road bridges,	600 each,	30,000 00
55 farm bridges,	500 each,	27,500 00
46 lock-houses,	600 each,	27,600 00
22,500 perches of fence at	50 cents,	11,250 00
		$163,850 00

SUMMARY.

62 Sections will cost,	$671,563 55
71 locks,	532,700 39
9 culverts,	177,649 50
45 waste-weirs,	67,500 00
50 road bridges,	30,000 00
55 farm bridges,	27,500 00
46 lock-houses,	27,600 00
22,500 perches fence,	11,250 00
	$1,545,763 44
Add for superintendence and contingencies, 10 per cent.,	154,576 35
Total cost,	$1,700,339 79

Total length of line, 15.1 miles.

Total lockage to 7 1-2 feet below surface of water in Presque Isle bay, harbor of Erie, 509.38 feet, which includes descent or bottom on the long levels of 1.68 feet.

No.	Lift and Guard.	Description.	Cost.	REMARKS.
58	8 ft. lift & 8 ft. guard.	Of wood.	$7,284 16	In the borough of Erie.
59	8.8	"	7,284 16	
60	8.8	"	7,284 16	
61	8.8	"	7,284 16	In Navy Yard run.
62	8.8	"	7,284 16	
63	8.8	"	7,284 16	
64	8.8	"	7,284 16	
65	8.8	"	7,284 16	
66	8.8	"	7,284 16	
67	8.8	"	7,284 16	
68	8.8	"	7,284 16	In Navy Yard run in Erie.
69	8.8	"	7,284 16	
70	8.8	"	7,284 16	
71	8.8	"	7,284 16	Out-let into Erie Harbour.
	507.7 feet.		$532,700 39	Total cost of Locks.
Add dec't. onbottom.	1.68			
T'l lock'g	509.38 feet.			

ESTIMATED COST OF CULVERTS.

No.	Description.	Size.	Cost.	REMARKS.
1	Of stone.	10 feet chord,	$1,170	On Section 17,
2	" "	" "	1,170	Section 19,
3	" "	20 "	4,567	Section 20—over Bole's run, let,
4	" "	20 "	4,567	Section 22—Maxwell's run, under cont.
5	" "	20 "	4,567	Section 25—Jackson's run, "
6	" "	2 arch. 30 ft.chord,	17,118	Section 27—E. Branch Conneaut, "
7	" "	1 10	1,170	Section 28—Crane's run, not let,
8	" "	2 60	74,897 50	Section 35—at Elk creek, under contract
9	" "	2 50	68,423	Section 49—Walnut creek, "
			$177,649 50	Total cost of culverts.

ESTIMATED COST OF OTHER WORK, viz:

45 waste-weirs at	$1,500 each,	$67,500 00
50 road bridges,	600 each,	30,000 00
55 farm bridges,	500 each,	27,500 00
46 lock-houses,	600 each,	27,600 00
22,500 perches of fence at 50 cents,		11,250 00
		$163,850 00

SUMMARY.

62 Sections will cost,	$671,563 55
71 locks,	532,700 39
9 culverts,	177,649 50
45 waste-weirs,	67,500 00
50 road bridges,	30,000 00
55 farm bridges,	27,500 00
46 lock-houses,	27,600 00
22,500 perches fence,	11,250 00
	$1,545,763 44
Add for superintendence and contingencies, 10 per cent.,	154,576 35
Total cost,	$1,700,339 79

Total length of line, 45.1 miles.

Total lockage to 7 1-2 feet below surface of water in Presque Isle bay, harbor of Erie, 509.38 feet, which includes descent or bottom on the long levels of 1.68 feet.

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Showing the cost of work done, the cost of work to be done, and the total estimated cost of work now under contract on the Conneaut line.

SECTIONS.

Sections.	Cost of work done.	Cost of work to be done.	Total cost.	REMARKS.
1	$1,592 90	$8,539 60	$10,132 50	Junction with the Shenango Line.
2	1,035 70	15,176 70	16,212 40	Summit Level.
3	1,100 90	18,861 50	19,962 40	" "
4	162 75	30,472 45	30,635 20	" "
5	5,907 24	21,346 76	27,254 00	Conneaut Summit.
11	3,005 26	1,099 90	4,105 16	Conneautville.
20	364 00	8,036 00	8,400 00	Cole's Run.
22	315 00	9,205 00	9,520 00	Maxwell's Run.
25	1,506 01	4,078 99	5,585 00	Jackson's Run.
27	2,549 60	13,595 40	16,145 00	East Branch of Conneaut.
33	2,250 00	13,096 00	15,346 00	In Hall's Run Valley.
34	255 00	9,173 16	9,428 16	
35	2,890 41	55,329 59	58,220 00	Crosses Elk Creek.
36	345 62½	13,193 01½	13,538 64	
37	1,025 25	12,493 15	13,518 40	Deadman's Run.
38	1,500 00	9,371 30	10,871 30	
39	1,398 90	23,701 01	25,100 00	Girard Village.
10	11,751 06	2,964 30	14,715 36	
49	3,000 00	72,275 00	75,275 00	Crosses Walnut Creek.
58	1,724 32½	3,535 67½	5,260 00	
59		3,842 02	3,842 02	Cascade Run.
60		4,480 00	4,480 00	
61	518 60	4,157 40	4,676 00	Head of Navy Yard Run, Erie.
	$44,198 33	$358,024 01	$402,222 54	

LOCKS.

No.	Cost of work done.	Cost of the work to be done.	Total cost.	REMARKS.
20	$255 00	$9,165 45	$9,420 45	In progress,
21	6 00	9,414 45	9,420 45	"
22	10 00	9,410 45	9,420 45	"
55		5,879 00	5,879 00	Nothing done yet,
56		5,879 00	5,879 00	"
57		5,879 00	5,879 00	"
58		7,284 16	7,284 16	"
59		7,284 16	7,284 16	"
60		7,284 16	7,284 16	"
61		7,284 16	7,284 16	"
62		7,284 16	7,284 16	"
63		7,284 16	7,284 16	"
64		7,284 16	7,284 16	"
	$271 00	$96,616 47	$96,887 47	

No.	Cost of work done.	Cost of work to be done.	Total cost.	REMARKS.
3		$4,567 00	$4,567 00	Cole's run, 1 arch, 20 feet chord,
4		4,567 00	4,567 00	Maxwell's run, 1 arch, 20 feet chord,
5		4,567 00	4,567 00	Jackson's run, 1 arch, 20 feet chord,
6		17,118 00	17,118 00	E. B. Conneaut, 2 arches, 30 feet chord,
8		74,897 50	74,897 50	Elk creek, 2 arches, 60 feet chord,
9	399 83	68,023 17	68,423 00	Walnut creek, 2 arches, 50 feet chord,
	$399 83	$173,739 67	$174,139 50	Total cost of culverts.

RECAPITULATION.

Items of work.	Cost of work done.	Cost of work to be done.	Total cost.
23 Sections,	$44,198 53	$358,024 01	$402,222 54
13 Locks,	271 00	96,616 47	96,887 47
6 Culverts,	399 83	173,739 67	174,139 50
2 Road bridges,		1,200 00	1,200 00
	$44,869 36	$629,580 15	$674,449 51
Add for superintendence and contingencies, 10 per cent. viz:			67,444 95
Total cost to complete,			$741,894 46

SUMMARY STATEMENT

Showing the length, lockage, cost of work done, cost of work to be done, and total cost of all the line under contract on the Erie extension of the Pennsylvania canal; together with the amount of money necessary to complete the same.

Shenango line.	Length in miles.	Lockage in feet.	Cost of work done.	Cost of work to be done.	Total cost of work.
Contracts in 1836,	45.5	175.5	$614,941 40	$372,781 94	$987,723 34
Contracts in 1838,	18.5	109	21,920 00	621,551 08	643,471 08
Conneaut line,	11.5		44,869 36	697,025 10	741,894 46
Superintendence,			39,646 00		
Total,	75.5		$721,376 76	$1,691,358 12	$2,373,088 88
Amount required to complete,				1,651,712 12	

SUMMARY STATEMENT

Showing the length, lockage and total cost of the whole Erie extension; together with the amount of money to complete the same.

	Length in miles.	Lockage in feet.	Cost of work done.	Cost of work to be done.	Total cost.
Shenango line,	64	284.5	$636,861 40	$994,333 02	$1,631,194 42
Conneaut line,	45.5	509.5	44,869 36	1,655,470 43	1,700,339 79
Superintend'ce. &c.			39,646 00		
Total,	109.5	794.	$721,376 76	$2,649,803 45	$3,331,531 21
Amount required to complete,				2,610,157 45	

In the above statements I have deducted $39,646 for superintendence which includes pay of Engineers and cost of surveys, &c. on the whole line up to to the present time, and as this is included, both in the cust of work to be done and the total cost under the head of superintendence and contingencies, I have deducted it with the cost of work done from the total cost, which ... the amount required to complete.

The Beaver division is thirty and three quarter miles long—lockage 132 feet, measuring from bottom of canal four feet below low water mark, in the Ohio river, at the mouth of Beaver river, twenty-eight miles below Pittsburg.

The whole length of canal and slackwater navigation, from this point, to the termination of the Erie extension at the town of Erie, is 140¼ miles—whole ascent to the summit level, at Conneaut lake, at bottom of canal, is 416½ feet—the whole descent, from thence to seven and a half feet below the surface of Lake Erie, is 509½ feet. Lake Erie therefore, at this point, is ninety-three feet lower than the aforesaid point at the mouth of the Beaver, and 123 feet lower than low water mark at Pittsburg. Total amount of lockage on Erie extension, including Beaver division, is 926 feet.

The lockage on the Franklin line, from the bottom of French creek feeder near the aqueduct, to bottom of canal below outlet lock, at the mouth of French creek on the Allegheny river at Franklin, is* 128½ feet; but as the descent in the feeder from the aqueduct to Conneaut lake is three feet—the lockage from this point to Franklin is 125½ feet.

By this it will be seen that the descent in the Allegheny and Ohio rivers, from Franklin to the mouth of the Beaver is 291 feet, and the descent from Franklin to Pittsburg 261 feet. Also, Franklin is 384 feet above Erie.

*This data is taken from the report of Mr. Livermore, the engineer for the Franklin line, made October 31, 1832.

FRENCH CREEK DIVISION.

This is composed of the French creek feeder and the Franklin line. The French creek feeder commences at Bemus' mill, a little above Meadville, and extends down the French creek, on the east side, about eight miles—thence crossing French creek by an aqueduct, it passes up along the outlet of Conneaut lake and terminates at the lake, in the distance of thirteen miles—making the whole length of the feeder twenty-one miles. Its dimensions are the same as other parts of the Pennsylvania canals. It has a descent in its bottom of three inches to a mile, and its object is to bring down the water of the French creek to feed the Franklin line, and supply the reservoir at Conneaut lake, which is to be the principal feeder for the canals from this place, connecting with Lake Erie at the harbor of Erie, and the Ohio river at the mouth of Beaver. This work was constructed several years ago, and is now a good deal out of repair. The feeder dam at Bemus' mill is in a state of ruin; for a more particular account of which see my report of last year. The aqueduct crossing French creek is also very defective and must be rebuilt. A good deal of earth and gravel has been washed into the canal, and must be removed, the banks strengthened, the bridges and weirs repaired or rebuilt, &c. &c. These repairs may be estimated as follows:

Repairing dam at Bemus' mill and work connected with it,	$19,143 00
Rebuilding aqueduct,	14,760 00
Clearing out canal and, repair of weirs, bridges, &c. 21 miles, at $2,500 00 per mile—21 miles,	52,500 00
Total cost of repairing feeder,	$86,403 00

Last year I was directed by the board to make an examination above the feeder dam at Bemus' mill, to see whether a safer and more favorable location could not be found. This examination has been made, and resulted in the selecting a point a little below McGuffins' falls, 365 perches above the old scite. Should this location be adopted, we must incur the expense of constructing the feeder this additional distance, of removing and rebuilding the guard lock, and constructing the new dam, which will cost altogether $28,921, or $9,778 more than to repair the old dam, and would swell the cost of repairs to $96,181 00.

The only thing to be gained by this location is safety to the dam, and the works connected with it. The old dam below is high, and there is an extensive mound connected with it, about fourteen feet high, extending up along on the east side of the pool, and is intended to confine the stream to its channel and prevent the water from overflowing the land in the rear of it. Above we shall have a lower dam and avoid the mound altogether.

Whether this advantage is sufficient to counterbalance the difference of the expense I leave for the board to decide.

FRANKLIN LINE.

This commences at the aqueduct, where the French creek feeder crosses the French creek, and extends down this stream to the town of Franklin on the Allegheny river—length twenty-five miles and forty-five chains. The amount of lockage is 128½ feet. As in the case of the Beaver division, the board directed me last year to make an estimate of the cost of putting this line in complete repair, but on account of the limited amount of appropriations very little has been done upon it—not more probably than would balance the damages done by floods, &c., since the date of my report. My estimate for last year may therefore be taken without any alteration, for the amount required for this. It is as follows:

Repairing dam No. 1,	$120 00
Lock No. 4,	8,700 00
Repairing dam No. 2,	4,800 00
" dam No. 3,	4,809 00
Rebuilding section No. 1,	6,480 00
" " 2,	3,150 00
" " 3,	4,845 00

Lock section No. 6,	3,085 00
" Dam No. 5,	5,925 00
" Dam No. 6,	7,300 00
" " 7,	1,525 00
" " 8,	3,626 00
" " 9,	4,616 00
Dams 10 and 11,	2,000 00
Lock No. 15,	10,650 00
Raising towing path,	4,430 00
Total cost of repairs,	$76,052 00

Last year I took into account, damages to land holders, sustained by them, in consequence of the unusual overflowing of the French creek, occasioned by the erection of the Sugar creek dam; but as I am informed that measures have been taken by the land holders themselves, to lay this matter before the board more fully than I could possibly do, and particularly as one of the members of the board, (Mr. Dickey) was on the ground in person, and examined for himself, it will not be necessary for me to say any thing further in regard to it.

It should be mentioned however, that the resolution of the board, dated at Farrandsville, July 23, directing me to make a survey, for for the purpose of ascertaining the practicability and cost of avoiding the Sugar creek dam, was received soon after its date, and the survey made accordingly. In making the survey, I went upon the plan of constructing a separate canal all the way, and dispensing with the dam and slackwater navigation. I commenced at Lock No. 3, taking bottom of canal, above this lock, for my level, which I carried all the way to the Sugar creek dam.

This enables us to cross Sugar creek on an aqueduct. The ground over which we have to pass, is rather unfavourable for the construction of a canal, it being uneven and broken—abrupt ridges frequently running in towards the creek, with low intervening swamps.

The distance is three miles and two hundred and eighty-three perches, which is twenty perches less, than by the towing path.—The lock at the head of the pool will have to be removed to the lower end of it.

ESTIMATE OF THE WORK.

Canal 3 miles and 283 perches,		$31,639 00
Lock (cut stone, including foundation, cement, &c.)		10,500 00
Sugar creek aqueduct,		6,900 00
One culvert at		1,000 00
Two culverts at	$ 500 each	1,000 00
Two waste weirs, at	1200 each	2,400 00
Seven farm bridges at	450 each	3,150 00
Three road bridges at	500 each	1,500 00
Twelve hundred and forty-four perches of fence at 50		622 00
Total,		$58,711 00

This I consider a fair estimate for the work, exclusive of the cost of superintendence, damages, and the removal of Sugar creek dam. If this dam were lowered two feet, and extended two hundred feet, the lock at the head of the pool lowered, and the channel excavated two feet deeper, I am inclined to think it would answer every purpose, and could be done for much less expense than the independent canal.

I will observe in conclusion, that this division in its present dilapidated and ruinous condition is, if any thing, an injury to the country through which it passes, rather than a benefit.

The feeder dam is destroyed—two of the locks are collapsed and thus rendered almost impassible—dam No. 4, is entirely carried away, and several other dams, and portions of work are so injured, that boats cannot ascend at all, and the descending crafts pass down with a great deal of risk and peril to the owners. And while the country is thus sustaining an injury by this work, the State is also a severe sufferer. She is not only losing the interest on the original cost, but the work, in consequence of repeated injuries from floods and other causes, in great danger, (particularly the dam) of being swept away altogether.

It therefore appears to me to be the true policy, to make these repairs as soon as practicable. Steamboats are now beginning to ply, to a considerable extent, upon the Allegheny river, between Pittsburg and Franklin, and as soon as this improvement is made navigable, a large amount of business will pass through it from the French Creek Valley. Thus, considerable tolls will be collected, the work will be preserved, the business community will be accommodated—property will be enhanced in value—and the long anticipated result of the improvement will, in some measure at least, be realized.

For further particulars in relation to this division, see my report of last year.

Respectfully submitted,

CHARLES T. WHIPPO.

Principal Engineer.

Engineer's Office,
New Castle, Nov. 10, 1838.

Report of W. H. Wilson, Gettysburg Extension.

ENGINEER'S OFFICE, GETTYSBURG,
December 20th, 1838.

To the Board of Canal Commissioners of Pennsylvania.

GENTLEMEN:—Having completed the revision on the Western division of the Gettysburg extension, referred to in my report of November fifth, I have now the honor of submitting estimates of the cost of the three sections not included in that report, I will take occasion to state that the line first located was very favorable in regard to direction, being straight for nearly the whole length of the three sections; it involved, however, the necessity of a tunnel about seventeen hundred feet in length, and some very heavy embankment. The line as revised is more circuitous, but it avoids the tunnel, and diminishes considerably the embankment at the deepest ravine, increasing however the embankment at each end of the tunnel hill.

Section No. twenty-four, length three thousand, two hundred and forty-two feet.

40,927	cubic yards of	earth excavation, at	twelve cents,	$4,911 24
31,946	"	solid rock, "	fifty "	15,973 00
77,916	"	embankment, "	fifteen "	11,687 40
	Grubbing and	clearing,		333 20
				$32,904 84

Section No. twenty-five, length three thousand, seven hundred feet.

39,126	cubic yards of	earth excavation, at	twelve cents,	$4,695 12
24,812	"	solid rock. "	fifty "	12,406 00
213,761	"	embankment, "	twenty-nine	61,990 69
	Grubbing and	clearing,		445 60
				$79,537 41

Section No. twenty-six, length two thousand, five hundred and seventy-six feet.

25,275	cubic yards of	earth excavation, at	twelve cents,	$3,033 00
22,233	"	solid rock, "	fifty "	11,116 50
153,890	"	embankment, "	twenty-nine	44,638 10
	Grubbing and	clearing,		364 00
				$59,151 60

Total amount of three sections, $171,593 85

The estimate of Sections twenty-four, twenty-five and twenty-six, on the first located line, amounted to two hundred and sixty-three thousand, twenty-eight dollars and forty-six cents, thus leaving a difference of ninety-one thousand, four hundred and thirty-four dollars and sixty-one cents, in favor of the revised line.

I have accordingly placed the profiles and specifications of these sections (according to the last location) in the hands of the superintendent, so that he may be prepared to contract for the work whenever he thinks proper.

Very respectfully,

W. H. WILSON, *Engineer.*

14	6772		6072	14,346 02	288 00	14,634 02
15	5082	528	5610	11,323 80	3,682 80	15,006 60
16	5478		5478	12,471 48		12,471 48
17	7458		7458	13,526 55		13,526 55
18	6270	1716	7986	11,498 42	10,638 82	22,137 24
19	4950		4950	9,232 38		9,232 38
20	8256	60	8316	31,201 14	1,887 46	33,088 60
	97448	21551	118599	$444,742 53	$421.828 93	$866.571 46

RECAPITULATION.

	Amount finished.	Amount unfinished.	Total cost.
Masonry,	$64,889 10	$15,624 30	$80,530 40
Grading,	444,742 53	421,828 93	866,571 46
	$509,631 63	$437,453 23	$947,084 86

Length of road graded, 97,448 feet or 18½ miles.
" " not graded, 21,551 " 4 "

The estimate of Sections twenty-four, twenty-five and twenty-six, on the first located line, amounted to two hundred and sixty-three thousand, twenty-eight dollars and forty-six cents, thus leaving a difference of ninety-one thousand, four hundred and thirty-four dollars and sixty-one cents, in favor of the revised line.

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Very respectfully,

W. H. WILSON, *Engineer.*

MASONRY.

No. of culvert.	No. and size of arches.	Locality.	Total number of perches.	Amount finished.	Amount unfinished.	Total cost.
1	1 of 12 feet,	Gettysburg,	392¼	$1,966 36		$1.966 36
2	3 of 14	Willoughby run,	1000	6,501 02		6,501 02
3	1 of 60	North Marsh creek,	1301	2,775 70	$6,349 50	9,125 20
4	2 of 12	Hinkelman's run,	286	1,585 70		1,585 70
5	2 of 12	" "	270	1,355 30		1,355 30
6	1 of 12	Beesecker's run,	322	1,489 00		1 489 00
7	1 of 6	D. Mickley's run,	223	1,037 00		1,037 00
8	1 of 20	P. Mickley's run,	621	1,6 8 30	1,243 50	2,851 80
9	3 of 20	West Marsh creek,	921	4,542 35		4,542 35
10	1 of 6	Beesecker's race,	217	1,033 62		1,033 62
11	1 of 12	Cold Spring road,	438	1,569 77		1.569 77
12	1 of 12	Myer's road,	1298	2,710 00	3,870 00	6,580 00
13	1 of 12	Myer's run,	2649	11,673 60		11,673 60
14	1 of 25	Tom's creek,	5957	20,875 68	4,161 30	25,036 98
15	1 of 6	Mind branch,	763	4,165 70		4,165 70
				$64,889 10	$15,624 30	$80,513 40

GRADING.

No. of section.	Length graded.	Length not grad'd	Total length.	Amount finished.	Amount unfinished.	Total cost.
1	4620 feet.	661 feet	5280 feet.	$25,745 72	$9,289 92	$35,035 64
2	2979	2244	5214	16,760 19	14,047 50	30,807 69
3	2772	2442	5214	47,655 26	139,430 00	187,085 20
4	4620	924	5544	27,881 98	17,040 00	44,921 98
5	2244	29 4	5148	9,958 48	25,100 00	35,058 48
6	4884	594	5478	23,241 62	11,924 50	35,166 12
7	3391	1493	4884	28,977 96	38,017 63	66,995 59
8	4338	2595	7128	50,067 31	65,457 83	115,525 14
9	4890	1644	6534	43,214 42	33,533 12	76,747 54
10	4269	2661	6039	22,426 89	29,122 63	51,549 52
11	3667	1085	4753	24,339 38	22,052 64	46,392 02
12	5346		5346	14,931 76	316 08	15,247 84
13	5076		5076	5,941 77		5,941 77
14	6072		6072	14,346 02	288 00	14.634 02
15	5082	528	5610	11,323 80	3,682 80	15,006 60
16	5478		5478	12,471 48		12,471 48
17	7458		7458	13,526 55		13,526 55
18	6270	1716	7986	11,498 42	10,638 82	22,137 24
19	4950		4950	9,232 38		9,232 38
20	8256	60	8316	31,291 14	1,887 46	33,088 60
	97448	21551	118599	$444,742 53	$421.828 93	$866,571 46

RECAPITULATION.

	Amount finished.	Amount unfinished.	Total cost.
Masonry,	$64,889 10	$15,624 30	$80,530 40
Grading,	444,742 53	421,828 93	866,571 46
	$509,631 63	$437,453 23	$947,084 86

Length of road graded, 97,448 feet or 18¼ miles.
" " not graded, 21,551 " 4 "

To the Board of Canal Commissioners of Pennsylvania.

GENTLEMEN:—The work upon the eastern twenty-two and a half miles of the Gettysburg Extension, Pennsylvania rail way, having all been contracted for previous to the last annual report from the engineer department, has been progressing in a favorable manner under the management of the same contractors, with the exception of the viaduct over North Marsh creek, which had to be re-let in the early part of the past summer. The same cause operated in this case which occasioned the re-letting of several culverts during the preceding season, viz: a greater difficulty in procuring good stone than was at first anticipated.

A single span of sixty feet had been substituted for the original design, which required three arches of twenty feet each: upon looking over the plan and specifications prepared by Mr. Mifflin, who had charge of the road at the time of letting, I thought it advisable to change the specification so far as to have the arch built of dressed stone instead of rubble masonry; this will increase the cost of the work somewhat, but will ensure its permanency. The re-letting has caused some delay in the prosecution of this viaduct, but the abutments being now built up nearly to the commencement of the arch, materials can be prepared during the winter, so as to have it completed early next season. In addition to the above there are three culverts yet unfinished; number eight, at Peter Mickley's, and number twelve, at Myers' road, will be completed this fall or in the early part of next summer; the arch is closed at Tom's creek, number fourteen, and the culvert will probably be finished in a few weeks. A large portion of the masonry on this line having been completed previous to my taking charge of the work, I may be allowed to express my opinion that it has been executed in a very superior manner, and will bear comparison with any of a similar kind which I have seen elsewhere.

The long distances from which stone had to be hauled, and the extreme hardness of nearly all that could be procured, have increased the cost of the masonry beyond the original estimates; but it is satisfactory to know, that this additional expense is fully made up by the permanency to be anticipated from the durable character of the materials.

Several sections of grading have been completed, some others will be finished in the course of a few months, and the remainder are in such a state of forwardness, that if vigorously prosecuted, the work can be accomplished in about eighteen months from this time.

The present contractors on Section number three, not being able to proceed, the section has been advertised for re-letting. This section containing the largest amount of work of any under contract, and being so situated as to bear division very advantageously, has been divided into three parts; consequently the re-letting instead of retarding the work will hasten its completion. The annexed tabular statements will show the amount of work done, and remaining to be done on each culvert and section of the Eastern Division, together with the length of road graded, and not graded.

Immediately after my appointment as engineer on the Gettysburg extension, in July last, I proceeded to comply with a resolution of the board, which required the location of eight miles of the rail way extending westwardly from the termination of the part under contract, and following the Waynesburg route. This portion of the line commences at the summit of the South Mountain, and descending along the western slope, terminates near the foot of the mountain north of Waynesburg.

After preparing for contract, it was deemed advisable to re-examine a portion of the route located; as sufficient time was not afforded for this purpose previous to the period fixed upon for letting, and as the alteration, if adopted, would only effect about a mile and a half of the road, three sections were retained; these sections will be ready for letting in about two weeks. The remaining six miles and a half divided into twelve sections have been placed under contract. The following is an estimate of the work at the prices for which it has been taken. The sections and culverts are numbered in continuation of those on the eastern division. All the culverts on the eight miles have been contracted for.

Section No. 21. *Length* 3402 *feet.*

Embankment	2099	cubic	yards	at 25	cents.	$251 88
Earth excavation	31228	do	do	17	"	5.308 76
Solid rock do	14585	do	do	60	"	8,751 00
Grubbing,						102 40
Cross drains,						75 00
						$14,489 04

Section No. 22. *Length* 2400 *feet.*

Embankment	38599	cubic	yards	at 12	cents.	$4,631 38
Earth excavation	2170	do	do	9	"	195 30
Solid rock do	28390	do	do	55	"	15,614 50
Detached rock	2315	do	do	22	"	509 30
Grubbing,						203 60
						$21,154 58

Section No. 23. *Length* 3400 *feet.*

Embankment	142291	cubic	yards	at 17	cents.	$24,189 47
Earth excavation	13689	do	do	9	"	1.232 01
Solid rock	26965	do	do	50	"	13,482 50
Grubbing,						360 40
						$39,264 38

Sections 24, 25 and 26 retained for revision.

Section No. 27. *Length* 3500 *feet.*

Embankment	12050	cubic	yards at 15	cents,	$1,807 50
Earth excavation	5211	do	do 12	"	625 32
Detached rock	6421	do	do 30	"	1,926 30
Grubbing,					230 80
Cross drains,					385 00
					$4,974 92

Section No. 28. *Length* 2700 *feet.*

Embankment	4095	cubic	yards at 13	cents,	$532 35
Earth excavation	5360	do	do 11	"	589 60
Detached rock	593	do	do 31	"	183 83
Grubbing,					134 00
Cross drains,					100 00
					$1,539 78

Section No. 29. *Length* 2400 *feet.*

Embankment	1148	cubic	yards at 14	cents,	160 72
Earth excavation	5788	do	do 12½	"	723 50
Detached rock	2238	do	do 32	"	716 16
Grubbing,					115 60
Cross drains,					75 00
					$1,790 98

Ssction No. 30. *Length* 2300 *feet.*

Embankment	50330	cubic	yards at 18	cents,	$9,059 40
Earth excavation	1525	do	do 11	"	167 75
Detached rock	13992	do	do 25	"	3,498 00
Grubbing,					206 80
					$12,931 95

Section No. 31. *Length* 2331 *feet.*

Embankment	8221	cubic	yards at	16 cents,	$1,315 36
Earth excavation	88	do	do	15 "	13 20
Detached rock,	4069	do	do	37 "	1,505 53
Grubbing,					130 00
Cross drains,					273 00
					$3 237 00

Section No. 32. *Length* 2900 *feet.*

Embankment	116253	cubic	yards at	18 cents,	$20.925 54
Earth excavation	21761	do	do	10 "	2,176 10
Solid rock,	12932	do	do	50 "	6,466 00
Detached rock	7677	do	do	28 "	2,149 56
Grubbing,					340 40
					$32.057 60

Section No. 33. *Length* 2200 *feet.*

Embankment	10511	cubic	yards at	12½ cents,	$1,313 87½
Earth excavation	2340	do	do	11 "	257 40
Detached rock	3906	do	do	26 "	1,015 56
Grubbing,					124 80
Cross drains,					255 00
					$2.966 63½

Section No. 34. *Length* 2800 *feet.*

Embankment	16462	cubic	yards at	25 cents	$4115 50
Earth excavation	3493	do	do	12 "	419 16
Detached rock,	2889	do	do	40 "	1,155 60
Grubbing,					167 60
Cross drains,					67 50
					$5 925 36

Section No. 35. Length 3700 feet.

Embankment	16414	cubic	yards at 12	cents,	$1.973 28
Earth excavation	72	do	do 15	"	10 80
Solid rock	5993	do	do 52	"	3,116 36
Detached rock	6724	do	do 30	"	2,017 20
Grubbing,					218 80
Cross drains,					310 00
					$7,646 44

ESTIMATE OF MASONRY.

Culvert No. 16, at	Red run,	491	perch. at	$3 56	$1,747 96
do ' 17,	Mackey's run	2384	do	3 74	8,916 16
do ' 18,	Hefner's do	3125	do	3 90	12,187 50
do ' 19,	Saldick do	2889	do	3 95	11,411 55
do ' 20,	Greenridge do	1661	do	2 90	4,816 90
do ' 21,	C'ld Spring do	3257	do	4 00	13,028 00
do ' 22,	Trucker's do	490	do	3 00	1,470 00
Probable cost of excavating foundations,					3,000 00
					$56,578 07

Cost of grading twelve sections,	$147.978 75
do Masonry on fifteen sections,	56.578 07
	$204,556 82

Upon the location west of the summit, the minimum radius adopted is 955 feet, being the same as on the eastern twenty-two miles. The maximum grade is one foot in a hundred or $52\frac{8}{10}$ feet per mile, being a fraction more than that assumed by Mr. Bailey in the location of the eastern division; but as I have made a greater reduction of grade on curves, the average will be about the same.

Having, in company with the president of the board, passed over the country between the termination of the location and Clearspring, I may observe that the ground seems favorably adapted for the continuation of one line. Should the location of the Baltimore and Ohio railway be such as to require the junction to take place near Clearspring, I do not apprehend any serious difficulties in obtaining a direct route to that place.

Respectfully submitted,

W. H. WILSON, Engineer.

Gettysburg, Nov. 5th, 1838.

Report of A. B. Aycrigg, Sinnemahoning, Tangascootack and Allegheny Feeder.

To THADDEUS STEVENS, Esq.

President of the Board of Canal Commissioners of Pennsylvania.

SIR :—In presenting the following annual report, of the state of the work committed to the charge of the undersigned, the substance of several partial reports has been introduced in order to sum up, and present the whole in a condensed form.

TANGASCOOTACK EXTENSION.

The old contracts on the Tangascootack extension, have all been completed, except the weir of the dam at Farrandville, which has not been constructed, but the account closed with the contractors in accordance with a resolution of the board to that effect, upon the representation that the contractors on their part, were willing to resign the balance of the work; that the dam would for the present be of no use to any one, but an additional obstruction to the descending navigation, in consequence of the long reach of dead water, incur the loss of the interest on its cost, require constant repairs, and be so much nearer the time of its renewal.

The chute authorized to be constructed in the Queen's run dam, is nearly completed, and upon a plan differing in some respects from those in common use on the state works, having a hydrostatic flood gate, similar to those formerly used by Josiah White in his descending navigation on the Lehigh. An arrangement that costs but little, and is of great utility.

The Queen's run dam itself, has never been fully completed, and consequently will not keep up the navigation when the river is low. The bottom of the river on the lower side of the dam, is also worn out about fourteen feet deep. To secure this dam, and make it water-tight, will require the expenditure of about $7,500.

SINNEMAHONING EXTENSION.

The total estimated expense of the Sinnemahoning extension is $1,285,867 95, or $39,084 13 per mile, the distance being thirty-two and nine-tenth miles.

This expense is unusually large, but not more so than was anticipated on the first view of the rugged features of the country, presenting thirty-six and a half per cent. or twelve miles of bluff. Several of the

flats are very high, and require deep cuts to bring the level down to bottom, while at the same time, we are obliged to take unusual precautions against the violence of a vast mountain torrent, for such, essentially, is the west branch.

There will be required thirteen culverts, five aqueducts, one dam, one guard lock, seventeen lift locks, varying from six to eleven feet, total lift one hundred and fifty feet, average per lock, 8.82, feet; sixteen lock houses, seventeen road, and thirteen farm bridges; nine and one-seventh miles of road along the bluffs, 25.3 miles of fence, six waste weirs, exclusive of those in the aqueduct, eleven and two-third miles of walling, and two and a half miles protected by stone facing or rip rap.

From the most accurate sources of information that could be obtained, as to the points reached by the highest freshets, it has been ascertained that the general height above low water of the flood of 1810 was twenty feet, of that in 1817 was eighteen feet, and of that in 1827 was seventeen feet, varying however, according to the width and fall of the river, while the ice dam in 1837, raised the water at one point twenty-eight feet. This is not regarded in the calculation, since the general opinion is considered correct in attributing the ice dam to the freezing of the dead water, caused by the dam at Queen's run, as the undersigned had an opportunity of seeing its commencement, when on retiring from the examination of the West Branch, and Allegheny line, on the 6th of December 1836, himself and party were stopped in their passage down the river, by the solid ice on the surface, checking, as it passed beneath it, the slush had originally been anchor-ice formed on the stones by the radiation of heat at night, reducing the temperature below that of the water, which had become equally cold throughout, in consequence of the agitation, in passing over the ripples, and this again detached when the sun rose, and the heat penetrating, the water was absorbed by the dark bottom. For several days in succession at daylight the river was perfectly clear, except the surface ice along the edges, but by nine or ten o'clock, it was covered with slush. This mixture of ice and water floated down, and collected under the solid ice, was frozen to the bottom on the night of the sixth of December, and thus acted as a filter, allowing the water to pass, but retaining the ice that was brought down the river when it broke up, and from the general account, it appears that at the dam commencing at this place, kept increasing until at eight miles above, it had raised the river twenty-eight feet above low water, as was ascertained by measurement, the ice itself having been much higher.

Believing this to be the true cause of his extreme freshet, the construction of the upper dam will throw the difficulty further up stream, and the work above that again be protected by other dams, constructed for the purpose of feeding as the work advances, while at the same time the distance in which the ice is formed, becoming shorter, all danger on this score will vanish.

Therefore, neglecting this freshet, the flood of 1810, or highest regular flood known, has been taken as the basis, and the calcula-

tion made to secure the canal against a freshet twenty per cent greater, and consequently by calculation, (neglecting small fractions that become nominal in a large stream), keeping the minimum height of the banks two feet above the surface of the assumed freshet, that will be about one seventh higher than that of 1810, or in the proportion of 1000. to 1.134, measuring from the bed of the river, and when necessary, grading the banks for the purpose of keeping them to the requisite height.

There is an exception to this rule, at the two outlet locks, as the water will back up through them, and in this case, the bank will be protected both inside and out, and the top covered by a flood wall.

The dam guard lock and guard gates, are calculated for the same height of freshet, so that the water shall pass between the abutments, and rise to the top when at its maximum, while the guard bank will, as in case of the canal banks, be two feet higher. The guard gates, in order to leave sufficient strength after they shall have been partially injured by time, made double the ordinary strength allowed for *dry* work, or such, that when new, they would just break with eight times the weight of water at full height above, and canal empty below, and the guard walls sufficiently strong to resist the thrust. The guard gates being heavy, and inconvenient for general use, to be left open, except in floods, and then shut *against* a lighter gate, sufficiently strong and high to support the weight of a *working* flood of eight feet above the crest of the dam. The proportion of eight times the breaking strength to resist a flood being produced by the combined strength of the two gates. These arrangements will require a high level, and this in some places will materially increase the first cost; while putting it lower, would leave the work out of danger, as long as the flood of 1810 shall not be exceeded by a greater, as has been the case elsewhere, and which may easily occur on this river from the more rapid thawing of the snow, as the country becomes cleared.

The line as established commenced about 40 rods below the mouth of the Sinnemahoning, with the bottom 18 feet above the surface of low water, but no arrangements were made for the feeding of the first 6½ miles, this extension having been viewed as only part of a longer line, to be continued up the West Branch or the Sinnemahoning in the first instance, and eventually up both, and the arrangement calculated to continue the West Branch line by crossing the Sinnemahoning by an aqueduct and feeding from above on both streams.

To leave the question as to the mode of extending the work, entirely open, the board omitted the first level and first lock, that if it should be considered preferable, a dam might be placed below the mouth of the Sinnemahoning, and the junction or feeding thus effected.

At 6½ miles from the commencement is placed the outlet lock, and the navigation thence continued by a pool of 2 miles to the dam, that will feed the canal to the pool at the Tangascootack.

The locks will be constructed by regular masonry, smoothly hammer-dressed in the face of the chamber between the recesses, and

from the surface line of the lower level to the top of the wall, to allow the boats to rise and fall easily.

One of the articles that has long been anticipated as a fruitful source of income from this section, has at last been produced and the experiment brought to a successful issue. The undersigned saw the furnace at Karthouse after it had been in blast several weeks, working to satisfaction, and producing with coke and a cold blast, from coal, limestone, and ore in rich abundance in the immediate neighborhood, iron that proved by the experiments at the Franklin Institute, to be of a superior quality.

And again at Farrandsville with a hot blast the same result, and the yield stated to amount to 80 tons *by weight* per week, and the furnace working to perfection on the 24th inst. when the undersigned left. These facts are sufficient, the inference can easily be drawn.

WESTERN DIVISION.

The advantage of having a feeder from the Allegheny to supply the present canal without any reference to a possible demand for an extension beyond Pittsburgh, has been rendered evident by the situation of the work during the last dry season. It is true that the canal was kept in good order below the aqueduct, and that this part only can be supplied from the Allegheny. The amount of water that passed the aqueduct at the mouth of the Kiskiminetas, 7th Sept. was 2960 cubic feet per minute to supply the 29 miles to Pittsburgh. No water passed at the time over the Leechburgh dam, but rather more than a fair proportion was lost through it. The total amount passing the aqueduct below Blairsville on the 13th Sept. was 2662 cubic feet per minute, and was nearly all the water of the river, while towards the head of the stream the amount rapidly diminished; so that with dams moderately tight there was not enough water to keep up the navigation. The freight boats were stopped and the passengers were transferred from the packets to flats and then proceeded with difficulty, the canal having but a few inches of water.

To keep up the navigation *below* the aqueduct, the water was drawn from *above*. Had the Allegheny feeder been in operation this would not have been the case, the river giving a large surplus, as the minimum flow of last season, when the water was lower than it has been since 1793, amounted to 72,000 cubic feet per minute. The amount of nearly 3000 cubic feet would therefore have been saved in the draught from the Kiskeminetas, and the navigation of the lower part of that river, and *above* the feeder kept up without difficulty. To supply the upper sections it is important to have the reservoir proposed by Mr. Welsh in 1834, constructed as soon as possible, since the natural flow of the Conemaugh is totally inadequate to the supply of the canal in dry seasons.

GRANTS' HILL TUNNEL.

To complete the Grants' Hill Tunnel, and bring the embankment to the original surface will require about $7000, there being about seven hundred perches of wall, and rather more than two thousand yards of embankment; but the measure not having yet been taken, the exact amount is not known.

On this division there are several repairs required that would be classed under the head of extraordinary. A close estimate has not been made. The locks, two of which are represented by those who have seen them when empty, to be in a dangerous condition, cannot be minutely examined until the water is drawn off in the winter.—Should these require renewing, this item of expense, together with the repairs of dams number three, four, and five, will probably amount to $16,000, and it is therefore considered best that this sum be appropriated together with $60,000, being about one half of the estimated expense of the reservoir, making together $76,000 exclusive of the sum for ordinary repairs.

ALLEGHENY FEEDER.

The line proposed by the undersigned as most useful for navigation, at the same time answering all the purposes of a feeder, and at no great increase of cost, contemplated a commencement about seven miles above Kittanning; the water to be collected by a wing dam, and thence carried by a feeder without any reference to navigation; and with low banks, allowing the freshets to pass over them as far down as Kittanning; thence, having secured the entrance by head gates and constructed side locks to enter from the pool at Kittanning, to commence the "navigable feeder" to enter at the aqueduct, and leave the present canal above the lock as it now is, beyond the reach of freshets which have already been above the bottom of the aqueduct, and consequently, about ten feet above the bottom of the canal if cut down to the level below the lock at Freeport. The banks to be graded from Kittanning as far down as necessary to keep out the floods, thus securing the boats from danger and keeping up a constant navigation, while on the lower level without unreasonable expense, it would be impossible to keep out the freshets, and, consequently, the trade would be occasionally interrupted at the most active season—the boats endangered by the drift or being carried over the *top* of the banks down the river—the canal filled with sediment, while the water is passing at times, fifteen feet over the top—the work certainly less safe with all our precautions and contrivances to counteract the disadvantageous circumstances under which it would be placed—a constant additional expense in the item of lock tenders, whose duties, although periodical, must nevertheless be attended to, and to avoid accidents, by men of more intelligence and judgment than are necessary for ordinary locks. As this plan of improvement

requires the work to be extended several miles above Kittanning, the board considered it beyond the limits of their authority as executive officers, and, therefore, keeping to a strict interpretation of the law requiring "a navigable feeder to be constructed from a point opposite or nearly opposite the town of Kittanning," directed a dam of four feet to be placed in the river near Kittanning, and the water thence conducted to the level at Freeport—thus bringing it to ten feet below the one proposed.

In accordance with this resolution the line has been established, and finding a descent equal to two inches per mile from the bottom at the dam, to the bottom at Freeport, this descent has been made uniform between the two points and will give a difference in the levels, and consequently lockage at Freeport two and one half feet when no water is drawn from the feeder.

The level being low, and among the freshets, above which we cannot at any reasonable expense keep the banks, we are again obliged to resort to grading but in the opposite direction. In the former case proposed for this work, as, also, on the West Branch, the object being to *keep out* the floods, the banks are graded parallel with the surface of the river, but in the present, in order to *receive* the water quietly and prevent injury, the banks will be graded *against* the current.

The ordinary summer freshet varying between twelve and fifteen feet above low water, the latter has been taken as the height of the bank at the dam. It is thence graded upward at the rate of ten inches to the mile, as the line follows *down* the river for the distance of three miles, at which place will be required a check lock or double check gates. Below this point the bank again commences fifteen feet above low water, is graded as before to a second, then again to a third set of gates, and finally to the aqueduct. A lock will also be required between the dam and the first offset.

The object of grading the banks against the stream, is to prevent the current passing through the canal, and finding some depression in the banks further down, running over with a *fall* into the river and wearing away the banks. The check gates are necessary for the same purpose, and require to be doubled in order that the boats may pass during freshets that do not cover the banks.

The water in rising, will be allowed to enter the canal freely at the head of each reach, and before it shall have attained the top of the first set of gates, will have filled the reach below and backed up against the gates, and thus successively to the end.

By this arrangement we shall in no stage of the water have a *fall*, either over the banks or gates, nor yet will the water pass through the canal, but must leave it where the surface meets the top, and merely form a ripple, the boats in the mean time seeking safety in harbours to be constructed by damming up the small runs, so that they can enter in case of a sudden rise, while the gates not being worked by balance beams, but by horizontal pitman after the manner of the locks in Holland, can be entirely cleared of every thing that would catch the ice or drift wood.

Of this work forty-four sections have been put under contract, commencing at ten chains above the aqueduct, and extending to a point nearly opposite Kittanning, a distance of 14.75 miles.

The estimate of the sections at the contract price, amounts to $432,255, which with five per cent for contingencies makes $453,867. The remaining work within the same distance, not yet arranged nor laid out, $67,100, which with ten per cent for contingencies, equals $73,810, or total for the 14.75 miles, $527,673, or $35,774 per mile.

Dam and appendages, together with work from Freeport to ten chains above aqueduct, $122,660, to which add ten per cent, equals $134,926, making a total to complete the work, $662,603.

It is considered important to call attention to the fact that navigable feeders are generally more expensive than canals of the same dimensions along the same line, especially when, as in the present case, the improvement runs along a river subject to very high freshets.

In an ordinary canal the levels can be regulated to suit the ground, while in a feeder we have no opportunity of chosing, and thus are frequently working along the edge of a high flat as if it were bluff, with the banks thrown into the river, perhaps in deep water, while at the same time, in order to make it navigable with any assumed freshet we are obliged to keep the top bank to that height and protect the whole with wall. A higher level enabling us to use the flat we should have less embankment and need no protection. To this must be added the expense of a dam, requiring strength in proportion to the violence of the stream, and if in a navigable river prepared for the ascending and descending trade, in proportion to the craft employed. That the latter remark may not be considered an objection urged by the undersigned against the dam proposed to be constructed near Kittanning, he takes the liberty of saying that such is not the case. That the low water of last summer proves the necessity of the dam for the purpose of navigation. That with the lock it will be so much towards the improvement of the river for steamboats, and with a chute suitable to the size of the rafts, be of no injury to the descending trade. It will at the same time furnish a safe harbour for steamboats if detained by low water, establish a communication from the town of Kittanning to the Pennsylvania canal, a connexion that they can claim as a matter of equity, since without it or an aqueduct the works of the commonwealth would raise up an opposition town that would flourish on the ruins of the beautiful village already established by the unaided enterprize of her active citizens, and throw unexpected wealth into the hands of those who have done nothing to deserve it. And it will be the means of passing the river, and continuing the line on the eastern side from Kittanning upwards. These remarks would apply with all their force, although it might be desired to alter the law, so as to allow the line to be raised to the higher level, and thus make a vast improvement in almost every respect, at a sacrifice of work already done, not exceeding $7,000, at the farthest. The undersigned was formerly of opinion that the water of the river

would always be sufficient by proper arrangement, without a dam, but the experience of last summer has convinced him to the contrary, and he now thinks that with any arrangement of levels, a dam should be built as proposed.

The propriety of an immediate settlement of damages to the land holders, is respectfully suggested. On the West Branch there are several small farms that are entirely destroyed by the canal. These narrow strips of alluvial bottoms are extremely valuable for the purposes of the canal, and where land was cheaper than labor, have been freely appropriated to the use of the commonwealth.

As farms, their worth is trifling, but still that little may be the whole support of the owners. It is believed that such is the case in some instances, and that they will suffer until they receive the means of purchasing elsewhere; since they are practically turned out of their present homes and the prospect of *future* pay, together with the legal interest, would be small consolation to one who felt the *present* want of bread for himself and family.

The extension of the West Branch canal to the Sinnemahoning, and the navigable feeder from the Western canal to Kittanning, on the Allegheny, being considered by the undersigned only part of the great link connecting the waters of the Allegheny, with those of the West Branch of the Susquehanna, and his appointment on the above as a continuation of the former, to ascertain the practicability of effecting the connexion, he has devoted much thought to the whole chain from Philadelphia westward by way of the West Branch, communicated with others on the subject of a proposed improvement throughout the whole extent, and a short time since, in order if possible to settle the question permanently with the public, and solve all doubts as to the supply on the summit, addressed a circular letter to many engineers and others familiar with the subject, requesting their views on this point. He has already received several communications from the highest authority, unfortunately however, in some cases, with the injunction to consider them confidential. But it may require a few weeks more to receive answers from those who are most distant, absent from home, or not having leisure to examine the letter, and write immediately.

When these shall have been received, he would desire to present a report in continuation of the present, taking a general view of the whole subject, and giving in full his own conclusions, and, as far as permitted, those of individuals, who have favored him with their opinions, and against whom the charge of being too sanguine and enthusiastic cannot be brought, as it might against the one who made the examination and proposed the improvement, if at the same time it were not suggested, that should the canal be constructed and proved a failure, it would be death to his professional reputation.

He hopes, when sustained by such assistance as he has already received, and other that he still expects, to be able to convince all who will take the trouble to examine not only that an entire water communication to the west is practicable, but that with the present sized

canal, the distance from Philadelphia to Pittsburgh will be effectually shortened by an amount equal to more than one hundred miles of canal, as far as expense of transportation is concerned, that Pennsylvania has it in her power to command the trade of the Ohio, if she will take the proper means, and that the prediction of the undersigned will be verified, "the man now lives who will see boats of one hundred tons burden freighted at St. Louis and discharged at Philadelphia, without breaking bulk on the way."

Respectfully submitted.

B. AYCRIGG,

Principal Engineer

of the works on the West Branch and Allegheny rivers, &c.

STATEMENT OF WORK.

Tangascootack Extension.

Contracts of former years, finished during the present year.

Lock and Lock section No. 2

Amount of former estimates,	$17,635 70½
Estimates of this year,	5,825 61
Final estimate, 22nd Oct. 1838,	$23,461 31½

Guard Lock No. 3, and Section at Dam No. 2.

Amount of former estimates,	$18,646 00
Estimates of this year,	10,157 07½
Final estimate, 2nd Oct. 1838,	$28,803 07½

Dam No. 2, and Dam Section.

Amount of former estimates,	$12,654 17½
Estimates of this year,	397 05½
	$13,051 23

CONTRACT OF THIS YEAR, FUNDS APPROPRIATED.

Schute in Queen's run Dam.

Amount estimated finished,	$11,086 65
Work remaining to be done	4,682 99
Total estimated cost,	$15,769 64

WORK REQUIRED NEXT YEAR, NO APPROPRIATION HAVING BEEN MADE.

Repairing Queen's run Dam,	$7,500 00

A considerable surplus, (amount unknown) will be left of the appropriation to this extension, not required for immediate use.

SINNEMAHONING EXTENSION.

ESTIMATE.

Work under contract, except 1st Section and 1st Lock.

Section	No.	1	$6,627 98
"	"	2	24,425 35
"	"	3	36,425 38
"	"	4	27,173 22½
"	"	5	10,040 91
"	"	6	4,706 08
"	"	7	7,980 01
"	"	8	3,725 00
"	"	9	3,919 27
"	"	10	4,287 15
"	"	11	7,010 46
"	"	12	8,218 83
"	"	13	5,598 72
"	"	14	44,105 19
"	"	15	45,938 46
"	"	16	12,185 79½
"	"	17	5,265 76
"	"	18	8,329 56
"	"	19	12,003 39
"	"	20	5,118 20
"	"	21	2,310 80
"	"	22	5,054 82
"	"	23	13,805 85
"	"	24	35,303 70
"	"	25	20,775 06
"	"	26	14,081 75
"	"	27	7,525 60
"	"	28	5,601 65
"	"	29	2,456 77½
"	"	30	36,634 00
"	"	31	35,004 15
"	"	32	15,964 50
"	"	33	21,290 46
"	"	34	15,455 32½
"	"	35	35,407 10
"	"	36	35,840 00
"	"	37	20,258 80
"	"	38	4,470 10
"	"	39	12,963 70
"	"	40	40,339 50
"	"	41	6,062 50
"	"	42	3,253 20
"	"	43	18,787 80

Section No.	44	9,634 00	
" "	45	23,020 60	
" "	46	24,341 80	
" "	47	21,036 50	
" "	48	10,837 00	
" "	49	7,571 10	
" "	50	3,677 60	
" "	51	2,895 80	
		$794,746 15	$794,746 15

CULERVTS AND SECTIONS ATTACHED.

No. 1	1 arch of 10 feet span	$3,194 00	
" 2	1 " 12 feet "	3,531 00	
" 3	2 arches of 14 feet "	5,362 00	
" 4	2 " 15 feet "	6,364 00	
		$18,451 00	18,451 00
			$813,197 15
No. 5	1 arch of 15 feet span	$3,214 00	
" 6	1 " 15 feet "	3,486 00	
" 7	1 " 10 feet "	2,929 00	
" 8	1 " 14 feet "	4,815 00	
" 9	1 " 10 feet "	2,520 00	
" 10	1 " 12 feet "	2,847 00	
" 11	1 " 3 feet "	1,203 00	
" 12	1 " 12 feet "	3,233 00	
" 13	1 " 3 feet "	1,356 00	
		$25,603 00	$25,603 00

LOCKS.

Guard Lock,	$11,916 00
Lock No. 1	9,000 00
" " 2	9,460 50
" " 3	9,414 50
" " 4	8,364 00
" " 5	8,051 50
" " 6	10,117 60
" " 7	6,347 57
" " 8	8,601 00
" " 9	9,073 50

Guard Lock,		
Lock No. 10	12,038 75	
" " 11	11,168 50	
" " 12	10,252 00	
" " 13	10,828 50	
" " 14	11,170 50	
" " 15	11,289 00	
" " 16	12,913 50	
" " 17	13,422 50	
	$183,429 42	$183,429 42
		$1,022,229 57

LOCK SECTIONS.

Guard Lock section	$7,806 91	
Lock section No. 1	3,120 87	
" " " 2	2,001 16	
" " " 3	1,855 64	
" " " 4	1,648 72	
" " " 5	2,763 00	
" " " 6	2,390 26	
" " " 7	1,934 25	
" " " 8	1,295 51	
" " " 9	5,095 00	
" " " 10	1,202 00	
" " " 11	2,382 40	
" " " 12	1,992 32	
" " " 13	3,227 00	
" " " 14	1,045 40	
" " " 15	4,711 40	
" " " 16	1,493 50	
" " " 17	1,998 50	
	$47,963 84	$47,963 84
		$1,070,193 41
Add five per cent		53,509 67
Total estimate for work under contract		$1,123,703 08

WORK NOT UNDER CONTRACT.

One dam 600 feet long, 17 feet high together with abutments and chute,	$50,000 00	
Five aqueducts,	40,000 00	
Sixteen lock houses,	6,400 00	
Seven hundred and thirty-one chains of road along bluffs, and four hundred and forty-four chains along flats,	23,580 61	
Seventeen road, and thirteen farm bridges,	15,850 00	
Eight thousand and ninety-two rods of fence,	8,092 00	
Six waste wiers,	3,500 00	
	$147,422 61	
Add ten per cent	14,742 26	
	$162,164 87	$162,164 87
Total amount estimated to complete the extension		$1,285,867 95

To this work $100,000 have been appropriated, and will probably be sufficient to meet the estimate on the 1st February, 1839.

WESTERN DIVISION, PENNSYLVANIA CANAL.

Required.

Extraordinary repairs, at two locks and three dams,		$16,000 00
Reservoir, (estimate of Mr. Welsh, 1835–6,)		127,705 00
To complete Grants' Hill Tunnel, estimate	$7,000 00	
Appropriation,	5,000 00	
Required,	$2,000 00	2,000 00
Total amount required on the Western Division.		$145,705 00

ALLEGHENY FEEDER.

ESTIMATE.—WORK UNDER CONTRACT.

SECTION	No.	1	$12,087 00
"	"	2	17,121 00
"	"	3	13,174 00
"	"	4	19,626 00

Section No.	5	8,712 00
" "	6	5,436 09
" "	7	7,120 00
" "	8	17,379 00
" "	9	5,754 00
" "	10	6,125 00
" "	11	15,072 00
" "	12	13,278 00
" "	13	9,661 00
" "	14	4,804 00
" "	15	4,543 00
" "	16	7,594 00
" "	17	9,254 00
" "	18	12,807 00
" "	19	13,127 00
" "	20	7,198 00
" "	21	10,867 00
" "	22	9,649 00
" "	23	13,911 00
" "	24	17,947 00
" "	25	2,437 00
" "	26	5,958 00
" "	27	3,420 00
" "	28	3,654 00
" "	29	3,086 00
" "	30	6,505 00
" "	31	5,931 00
" "	32	8,119 00
" "	33	9,618 00
" "	34	13,969 00
" "	35	13,927 00
" "	36	15,561 00
" "	37	11,807 00
" "	38	16,103 00
" "	39	14,774 00
" "	40	6,252 00
" "	41	3,976 00
" "	42	11,737 00
" "	43	9,175 00
" "	44	4,000 00
		$432,255 00
Add 5 per cent.		21,612 75
Total under contract,		$453,867 75
		$453,867 75

Work within same distance, not under contract, not laid out, nor plans made.

Four dry wall locks,	$20,000 00	
Four large culverts,	20,000 00	
Four inlet culverts,	4,000 00	
Four lock houses,	1,600 00	
Fences,	1,500 00	
Bridges,	5,000 00	
Roads,	15,000 00	
	$67,100 00	
Add 10 per cent.	6,710 00	
		$73,810 00
Required for 14-75 miles,		$527,677 75
Cutting down Canal between Freeport and the aqueduct, putting in extra lock at aqueduct, and passing point of rocks	$52,660 00	
Dam, 1250 feet long, 7.5 feet high from from bed of river,	30,000 00	
Steamboat lock and chute,	30,000 00	
	$122,660 00	
Add 10 per cent.	12,266 00	
	$134,926 00	134,926 00
Total to complete the Allegheny Feeder,		$662,603 75

Of this $30,000 have been appropriated, and will probably be exhausted by 1st of February 1839.

RECAPITULATION

Of the funds required for the different works above mentioned.

To the Tangascootack extension, a transfer of part of an appropriation already made, from new work, to the repair of the present on same extension,	$7,500
To the Sinnemahoning extension, supposing it intended to supply the money as fast as it can be used,	500,000
To the extraordinary repairs on the western division,	16,000
To the reservoir on the Conemaugh, if intended to finish it in two years,	60,000
To complete the Grant's Hill Tunnel,	2,000
To the Allegheny Feeder, if intended to drive it on rapidly and have its use to keep up the western navigation,	300,000
Total amount,	$885,500

Finishing the Queen's run dam on the Tangascootack extension, the extraordinary repairs on the Western division, the reservoir on the Conemaugh, and the Grant's Hill Tunnel, do not require an immediate supply of funds. The transfer of the balance not required immediately on the Tangascootack extension, to the use of the Sinnemahoning extension, in addition to the balance of the $100,000, will probably be sufficient until the first of April, unless a confidence in a full appropriation, should produce greater activity on the work, while the estimate of the fifteenth of January, will likely take all that remains of the $30,000 appropriated to the Allegheny feeder, and a cessation be the consequence, and the hands scattered unless an appropriation be made before that time.

Respectfully submitted,

B. AYCRIGG, *Prin. Engr.*

Report of Hother Hage, Chambersburg and Pittsburg Survey.

To the Board of Canal Commissioners of Pennsylvania:

GENTLEMEN:—In obedience to your instructions, I have the honor to present the following preliminary reports on the exploration of a route for a rail road from Chambersburg to Pittsburg, and of slack water navigation from the Coal and Iron region of Bedford county, to the public works on the Juniata River, intending to submit further reports as soon as the necessary estimates, maps and profiles shall be completed.

RAIL-ROAD FROM CHAMBERSBURG TO PITTSBURG.

The instructions under which the present examination was conducted, required a route for a continued railroad, without inclined planes, on which stationary power would be necessary; or in the event of its impracticability, such a portion of a Mac-Adamized turnpike as would continue the transportation partly by this mode of communication. A wide scope of country untrammelled by any intermediate fixed points, and only limited by the Pennsylvania improvements on the north, was granted for the exploration.

On examining the district embraced within these limits, the valley of the Potomac river by the way of one of the branches of Will's creek near the source of Flaugherty creek and thence by Castleman's, the Youghiogheny and Monongahela rivers to Pittsburg, strikes the observer as a natural opening for a route possessing certainly the advantago of opposing but a single summit between the eastern and western terminations of the line. This route has already been found practicable by actual survey and is believed to be the line adopted by the Baltimore and Ohio rail road company, but as a great portion of it would pass without the boundary of the State of Pennsylvania, it is doubted whether it could be considered as a line intended for examination.

The great length too of this route would render it objectionable and the contemplated connection of the Franklin rail road with the Baltimore and Ohio improvement, makes at all events an examination at present unnecessary.

On the other hand it was thought that a exploration in a direction nearly contiguous to the Pennsylvania improvements, though "south of them" would be equally undesirable.

Here the great length also, the difficulty of approach to the Alleghany mountain in this quarter from the east, and the uncertainty of sur-

mounting that barrier in the immediate vicinity of the Portage rail road, would render the exploration of this route inexpedient excepting only in case other lines should fail.

A route situated between these two was therefore considered most desirable, thereby aiming at the shortest practicable line and leaving for future surveys the routes that may claim advantage in point of easy grades. With this view a thorough reconnoisance was made of this region, its topography was closely studied and the intricate passses of the mountains explored.

The formation of the Allegheny range of mountains, is generally so well known for regularity, that any one portion of it may in a great measure serve to convey an idea of the whole. Their character in counties traversed by this survey, has however peculiar features that favor the location of a rail road. By a reference to the map a better idea of these may be obtained, than can readily be conveyed by description.

It will there be seen that the Cove mountain, Scrab Ridge, Sideling and Ray's hills, Tussey's, Evitt's, Will's, Buffalo and the Allegheny mountains, together with Laurel hill and Chesnut ridge, form the most prominent obstacles to be passed. The Raystown branch of the Juniata river, flows however several miles in an easterly direction from the Allegheny mouniain, opening a passage through or around Tussey's, Evitt's, Will's, and Buffalo mountains. Near a source of this stream, but west of the Allegheny mountain an elevatian in the ground crosses the valley between the mountain and Laurel hill so as in a manner to connect them, causing the waters in Somerset county to flow to the north into Connemaugh and south into Castleman's river.

Farther west the Loyalhanna creek forms a convenient gap in Chestnut ridge, nearly in a direct course towards Pittsburg. Again, if we turn to the east a depression will be found in the Cove mountain where it joins the Tuscarora, and the waters of Aughwick creek flows through the only gap in Sideling hill that can be found for many miles.

In this manner the line commencing at Chambersburg passes through Cumberland Valley, crossing the West Branch of Conococheague creek some distance below Loudon, thence ascending the side of Cove mountain it reaches Couan's gap, and descending the water of Aughwick creek by the Burnt Cabins to Sideling hill run, it turns up that stream. Passing through Well's valley it meets Rays hill, or more properly a point where the Harbour mountain joins the Broad Top mountain, where a tunnel will be unavoidable.

By these means the waters of the Raystown Branch of Juniata are attained, when the route passes through Ground hog valley and crosses the Juniata Branch near Piper's Run, where it ascends into Woodcock valley, whereby a near cut is effected to Bloody Run. At the village of this name the line again meets the ravine of the Juniata, and passing the town of Bedford continues to ascend along the river bank

until Buffalo mountain is attained. Here an increased grade in the road will take the line on high ground.

Crossing from Buffalo mountain to Dry Ridge, a spur of the Allegheny mountain is reached, and by ascending along the slope leading to Deeter's run it crosses that stream, meeting the main ridge of the Allegheny at a favourable place for the second tunnel.

After penetrating through this mountain, the line takes a southerly turn towards Berlin, thence sweeping to the west it passes about three miles north of the town of Somerset, and pursuing the dividing ground between the waters of Conemaugh and Castleman's river it meets the base of Laurel Hill.

From this point a very circuitous route, winding amongst the ravines of the mountain, takes the line to Laughlinstown, and descending along the valley of Loyalhanna, it passes Ligonier; thence after passing through the Gap in Chesnut ridge, it leaves this creek near the mouth of fourteen mile run.

Having ascended the valley of this stream, the line was conducted by the sources of the Crab tree run to the waters of Sewickly creek and thence near Greensburg to the waters of Brush creek. By descending this stream and Turtle creek it meets the Monongahela river, and by its bank finally reaches Pittsburg, terminating at the outlet of the Pennsylvania canal into this river.

The following tabular arrangement will more fully illustrate these points, their distances apart and levels above the place of commencement at Chambersburg.

	Intermediate distances.		Total distance from Chambersburg.		Levels in feet above Chambersburg.
From Chambersburg to Cowan's gap,	29 m.	$36\frac{69}{100}$ chs.	29 m.	$36\frac{69}{100}$ chs.	609.00
Thence to Burnt Cabins,	6	34	35	70.69	242.80
" Mouth of Sideling hill run,	9	78	45	68.69	80.70
" Gap in Sideling hill,	10	28	56	16.69	248.80
" Tunnel through Harkour mountain,	9	9	65	26.05	888.70
" Raystown Branch of Juniata,	6	78	72	24.05	268.50
" Bloody run,	9	50	81	74.05	400.00
" Bedford,	8	$10\frac{48}{100}$	90	4.53	446.40
" East end Allegheny tunnel,	32	$47\frac{24}{100}$	122	51.77	1854.82
" Top of Allegheny mountain,	0	20 chs.	122	71.77	2329.76
" Near Berlin,	7	36	130	27.77	1672.74
" Somerset (town being 1492,35 a)	12	24	142	51.77	1704.25
" East base of Laurel Hill,	10	$59\frac{2}{100}$	153	30.79	1605.19
" Top of Laurel hill,	8	78	162	28.79	2081.69
" Turnpike at Laughlinstown,	27	29	189	57.79	718.97
" Ligonier,	3	33	193	10.79	545.63
" Where line crosses Loyalhanna creek,	9	53	202	63.79	375.69
" Merkle's summit,	4	55	207	38.79	675.21
" Barnhart's summit,	1	72	209	30.79	562.95
" Barclay's,	4	79	214	19.79	619.10
" Mouth of Brush creek,	12	59	227	8.79	150.92
" Mouth of Turtle creek,	5	66	232	74.79	147.49
" Outlet lock of Penna. canal at Pittsburg,	9	78	242	72.79	94 20

Whilst the operations incident to the survey of this line were carried forward, it became sometimes doubtful whether by deviating from the line at certain points, and again intersecting it at some distant station a more eligible location might not be obtained.

The extent of the survey and a desire to prove the practicability of the route for an uninterrupted rail road communication before the field operations should be closed, by the severity of the approaching season prevented in several instances their examination. The most important of these would change the entire location a distance of about twenty miles.

Two portions of the line offer opportunities of this character, and are too important to be neglected. The first would leave the present route about four miles west of Bedford, and ascend the valley of Deeter's run on the opposite side. Passing in the vicinity of Schellsburg it would meet the main ridge of the Allegheny sooner, and attain a depression in this mountain situated about a mile and a quarter to the north of the present tunnel.

This point was found to be 368 $\frac{64}{100}$ feet lower than the summit of the mountain over the tunnel, or 106.29 feet higher than the grade of it. Thus perhaps the necessity of a tunnel here might be avoided, and as this pass appears to be the lowest attainable, its examination is strongly recommended.

The other part of the line that may be much improved by further examination is situated on the Western slope of Laurel hill.

On the summit of this mountain a favorable depression was discovered, where the road may cross without even any considerable depth of cutting; but in descending the Western side, serious difficulties were encountered. These consisted not so much in the expense that would attend the construction of the work, as in the unfavorable curviture that was necessarily adopted, particularly in two instances where the radius would not exceed four hundred and seventy feet, and in some others where it was below one thousand feet, thereby also increasing the distance materially. The impenetrable nature of the woods and the intricate position of the ravines, permitted the party that was engaged on this part of the line during three months, only to get an accurate knowledge of the topography of this part of the mountain which resulted in the location made. More extensive surveys would by all means be advisable, before the construction of this part of the line is commenced, and the survey now made will materially faciliate their successful execution.

Among the deviations from the main line which underwent examination by survey, one only is worthy of notice. This departs from it at the western base of Chesnut ridge and turns in a southerly direction, passing through Youngstown and ascending along the Nine Mile run it has a favorable summit near Pleasant Unity. Thence by the valley of Sewickly creek, the line is carried over good ground until it approaches near to Youghiogheny river, where some short bends in the creek confined by abrupt hills, render a location more difficult.

After joining the River the line was taken along its bank past McKee's Port to the Monongahela river, and continued to the mouth of Turtle creek, where the other route is met.

The only advantage possessed by this line consists in its passing through one of the most fertile and highly cultivated parts of Westmoreland county, offering but few natural obstacles to a cheap construction. The line will however be materially increased in length, if this route is adopted; if the meanderings of Sewickly creek near its mouth are pursued the length would be 20 miles and 73 chains greater than the Brush creek route; and if the line should be carried on the high ground across these bends of the creek, the distance would still exceed by $16\frac{1}{4}$ miles the route first recommended. In the latter instance, also some expensive work and steep grades in the inclination of the road would operate seriously against its adoption.

Other detours from the line first spoken of have been suggested, these have not been examined, but it is believed that they would all have a tendency to lengthen the line, however advantageous they may be in point of grades and cheapness of construction. It is of great importance to have some of these thoroughly surveyed, in order that accurate comparison may be formed among them, one in particular is important, as it would change almost the entire line west of Bedford. It would leave the present line at the Buffalo mountain and by the waters of Will's creek join the location of the Baltimore and Ohio rail road, thence by Flaugherty creek, Castleman's and Yougheogheny rivers, it would intersect the line run at the mouth of Sewickly creek. Between the towns of Bedford and Chambersburg it is believed that no material change in the route can be made.

The bold and unbroken character of the mountains in this quarter, offers no openings that would favor an attempt at reducing either the length or the cost of the road; should it therefore be deemed expedient to commence the construction of this important work, that division could be at once prepared for contract.

Taking finally into consideration the whole line as now established, independent of anticipated improvements by future surveys, it will perhaps appear, that its length of nearly two hundred and forty-three miles would hardly justify calling it the shortest practicable route for a road of the description required, when a communication between the eastern and western *cities* is the object.

In that case it would appear that the distance by rail roads from Philadelphia to Chambersburg, now in operation being stated at 157 miles,

and the present line from Chambersburg to Pittsburg being 243 "

making 400 "

and by the state improvements the report of the Canal Commissioners of December 1836, stated it at $395\frac{43}{100}$ "

which makes a difference in favor of the latter, of $4\frac{57}{100}$ "

It would therefore seem that a rail road extending in a parallel line along the present improvements, would be so much shorter. But if it is recollected that $4\frac{33}{100}$ miles of the Portage rail road are occupied by inclined planes overcoming an elevation in ascent and descent of 2,007.02 feet; it will then be seen that a road uninterrupted by inclined planes, overcoming this elevation even at a grade of sixty feet inclination in a mile, necessarily would add (if localities would render it at all possible) about twenty nine miles to its length, thereby making that road about twenty-four miles longer than the one here recommended.

SLACK WATER NAVIGATION ON THE RAYSTOWN BRANCH OF THE JUNIATA RIVER.

On examining the situation of the Broad Top mountain containing the coal and iron region, to which this branch of the Juniata river opens imperfect access, it will be found, that the rich products of its minerals, continue in a great measure buried for want of ready means of transportation.

The natural position of an extensive bituminous coal region in Pennsylvania, lying so near to the tides of the Atlantic, together with the superior qualities of the mineral demanding facilities for a market, make it necessary to examine in what manner so important an object can best be attained.

Three modes of transportation were authorized for examination, "canal, rail road, or slack water navigation," so as to connect with the public works on the Juniata river, as well as with the contemplated rail road from Chambersburg to Pittsburg.

In executing the charge thus authorized, the material to be transported and the direction in which it is destined to be carried, naturally made an uniform mode of transportation receive the preference.

The great advantage water communication possesses over that by rail roads, relates almost entirely to heavy burthens of little value compared to their weight. These are moved while afloat by a small force, rendering their transportation cheap, though less speedy than on a rail road, and the expense as well as waste, attending transhipment at the junction of the improvement with the Juniata canal will be avoided.

The survey was therefore executed solely with the view of constructing a water communication of dimensions that would admit the boats now used on the Pennsylvania canal.

Slack-water navigation was exclusively adopted, except where a canal would either reduce the length, or materially favor the cost of construction.

By examination it was found, that this branch of the Juniata river, washes the base of what may be termed the Coal Region, from the mouth of Yellow creek, at Hopewell iron works, to the out-let of Trough creek, a distance of twenty-nine miles and fifty-six chains. The latter stream empties into the Raystown Branch of the Juniata,

about twenty-four miles and a half from the Pennsylvania canal, making a total length of navigation of fifty-four miles and fifteen chains, that will embrace the entire west side of the coal region of Broad Top mountain.

It is designed to construct the towing path on the side of the river opposite the coal beds, thereby permitting the entire shore along the mountain to be occupied as wharves for lading boats, without in the least interfering with the moving trade.

This can be done at a reasonable expense, though the banks in some instances are precipitous.

These difficult places, however, seldom reach a fourth of a mile in length, nor is that distance exceeded in any case. At least twenty-three dams must be constructed and 266.25 feet of lockage overcome. Favorable sites for the dams had generally been obtained, and their height has been regulated so, that but very little land will be inundated by their pools.

Should a connection be desired between this navigation and the rail road surveyed from Chambersburg to Pittsburg, a branch from where that road crosses the Raystown branch, extending to Hopewell iron works, or the head of the navigation would effect that object.

This branch would be five miles long, and would have a descent towards Hopewell of 121.66 feet; but the irregularity of its curves would preclude the use of locomotive engines, unless great expense was encountered. Horse power would therefore necessarily be substituted.

The mines on the mountain may, however, at many places be made to communicate by branch roads with the Chambersburg and Pittsburg road, as the line p sses several miles along the margin of this region and within about three miles of the coal strata.

All of which is respectfully submitted.

HOTHER HAGE,
Civil Engineer.

ENGINEER'S OFFICE, CHAMBERSBURG,
November 17th, 1838.

ERRATA.

Page 6, (No. 17,) Line 1st, make 50,000 read 59,000.
" 7, " " 14th, " *an* read *no*.
" 12, " " 32d, " *combining* read *combined*.
" 13, " " 13th, " 52 read 27.
" 19, " " 9th, " *may* read *way*.
" 20, " " 14th, " *employed* read *completed*.
" 22, " " 24th, " *offering* read *affording*.
" 27, " " 18th, " *draught* read *drought*.
" 27, " " 23d, " *our* read *an*.
" 28, " " 15th, " after the word *line*, insert the following, *(transporting the products of the west, and the merchandize of the east, will always form a large amount, and will continue to augment, with the increase of the western states, until the capacity of the main line)*
" 28, " " 26th, " *date* read *data*.
" 30, " " 28th, " *three* read *there*.
" 30, " " 30th, after *Middle* insert *creek*.
" 31, " " 26th make *application* read *completion*.
" 32, " " 13th, after the word *on* insert *the*.
" 32, " " 15th, make *of* read *for*.
" 32, " " 46th, " 22,229 03 read 22,229,003 00
" 34, " " 1st, " *extending* read *extended*.
" 34, " " 16th, " *onset* read *outset*.

REPORT

OF THE

AUDITOR GENERAL

RELATIVE TO THE

ACCOUNTS FOR THE REPAIR OF THE CANAL

BETWEEN

HUNTINGDON AND HOLLIDAYSBURG.

READ IN THE HOUSE OF REPRESENTATIVES, JAN. 15, 1840.

HARRISBURG:
HOLBROOK, HENLOCK, & BRATTON, PRINTERS.
.....
1840.

REPORT.

AUDITOR GENERAL'S OFFICE,
Harrisburg, January 14th, 1840.

SIR :—In compliance with a resolution of the Legislature, approved the 2d day of July, 1839, I have the honor to transmit, herewith, a report in relation to the accounts for the repair of the canal between Huntingdon and Hollidaysburg, during the Summer of 1838.

I have the honor to remain, respectfully,
Your obedient servant,

GEO. R. ESPY,
Auditor General.

HON. WILLIAM HOPKINS,
Speaker of the House of Representatives.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania:

GENTLEMEN :—By a resolution approved the 2d day of July, 1839, it is made the duty of the Auditor General to ascertain the amount of money fairly expended for the repairs of the Juniata Canal, between Huntingdon and Hollidaysburg, during the Summer of 1838, so far as it had been done by money loaned by the late Executive, on credit of the State, without law, and to draw his warrant for the amount so found in favor of the United States Bank, and the Harrisburg Bank, and to make report of his proceedings to the Legislature.

Immediately after the approval of the Resolution, the accounts of the disbursing officers, as rendered to the accountant department, by James Steel, Esq., were taken up with a view of complying with the requisitions of the Legislature. It was then discovered that Mr. Steel asked a credit for $336,216 46 cents, while he had not returned receipts in his own name for more than half that amount: the remainder being in the names of different individuals, his name not appearing on the vouchers, which, together with the loose and singular manner in which the accounts were generally kept, the discrepancy between the amount of credit asked, and the message of the late Executive, as recognized by the Legislature, in two successive acts, rendered it

essentially necessary for the accountant officers to have further evidence to enable them to understand the accounts submitted to them for settlement. Trusting that Mr. Steel would have it in his power to elucidate, satisfactorily, the accounts for which he asked a credit of the Commonwealth, I addressed him by letter, with information that I would be at Huntingdon, on the 19th of July, for the purpose of procuring such evidence as could be had explanatory of the subject, and requesting his assistance in the investigation. In accordance with this arrangement, I repaired to that place on the day named, and after seeing Mr. Steel, fixed Water Street as the place, and the 24th of July as the time to receive testimony, and such evidence as could be procured relative to all the facts touching the expenditure of money, for which remuneration was asked from the Commonwealth.

Mr. Steel at first appeared at the investigation in Water Street, and I flattered myself, that with his assistance, uniting to his legal knowledge the character of a good accountant, to be enabled to comply, at an early period, with the requisitions of the Legislature, in all its parts. Soon after the commencement of the investigation, the testimony tending strongly to impeach the legality of the accounts and vouchers, as rendered, Mr. Steel gave notice, through his counsel, Mr. Bell, that he could take no part in the investigation; that he had discharged his duty as an officer, when he paid the money, placed in his hands by the late Executive, to persons producing papers purporting to be vouchers for labor performed on the break, without regard to the fact of their correctness; and produced a letter signed "Thaddeus Stevens," the then President of the Board of Canal Commissioners, for the purpose of establishing that fact. Mr. Steel's refusal to assist or take any part in the investigation of the accounts rendered by himself, led to much difficulty during the progress of the investigation.

An impression got abroad that the object of the inquiry was to compel the men who had been engaged on the public works, to refund or pay back to the State what they receipted for more than they had actually received. This being a large sum in the gross, many gave testimony with much apparent reluctance. The difficulty was still farther increased by the county officers, who, feeling it to be their duty caused a few individuals to be arrested, who were believed from the testimony to have fraudulently obtained, or got on false vouchers, the public funds.

More effectually to secure the design of the Legislature, I invited to my assistance the Attorney General; and it is to be regretted that his other duties deprived the State of his legal abilities and experience, in a matter in which she was so deeply interested. I was then left to ascertain the facts, in relation to the accounts, without the prospect of finding a single witness conversant with the transaction, who would not believe, to a greater or less degree, that he had a personal or pecuniary interest involved. As the investigation progressed, this prejudice partially subsided: finally enabling me to elicit such facts as utterly to dispel all hopes of a speedy termination. Mr.

Steel having declared his intention to withdraw from the investigation, and it being in testimony that the original time-books, as kept by the foremen or bosses, were not returned, a written notice was served on him to produce them; with this requisition he never complied—subsequently he stated he had them not in his possession.

As the resolution directing the Auditor General to settle the accounts, declares that "he shall audit and settle the accounts aforesaid, upon the same principles, and in the same manner, as the accounts for repairs and construction of the canal are settled, and according to the mode prescribed by the existing laws," it becomes necessary for the better understanding of the testimony, and this report, to give a brief description of the manner of keeping and settling the accounts on the public works.

Every person engaged in the service of the State, other than salary officers, are required to have testimony of the time they were actually employed. Some are permitted to prove their own time, such as Assistant Engineers, &c. Superintendents of Canal have charge of new work, and disburse money only upon estimates of the Engineer: the work being all done by contract. On finished lines, the work being generally too light at any given point to contract with advantage, led to the appointment of a new set of disbursing officers, with power to have the work done either by contract, or by the day. These officers are called Supervisors, and give bond in like manner with Superintendents to the State, for the faithful disbursement of all moneys placed in their hands. As disbursing officers, they are prohibited from keeping the time of the hands. When work is done by the day, they are required to select a hand as time-keeper or foreman, whose duty it is to keep the time of the hands on a paper called a check-roll, blanks of which are furnished by the State. To each of these check-rolls he makes deposition, stating in words, written at length, the whole number of days for which the Supervisor is entitled to credit from the State. For this service the foremen generally receives a small additional compensation, and is prohibited from keeping a boarding house for the hands, purchasing tools, materials, or other property for the State, or settling her accounts. The check-rolls, so made and attested, are delivered to the Supervisor, whose duty it is, if he believe, after a careful examination, the accounts so rendered, to be just, to pay each individual personally, taking his receipt upon the check-roll. This system renders it difficult to commit fraud without a combination, which could be easily practiced, and with but little chance of detection, were supervisors permitted to keep the time, or foremen to pay the hands.

When materials, such as lumber, iron, tools, &c., are required, they are purchased by the supervisors, for which a bill is rendered including every item; and to the accuracy thereof, evidence is required. In some instances, when the accounts are small, and the articles of the ordinary kind, the certificate of the Supervisor, that the account, as stated, is just and true, and had for the use of the Commonwealth, has been admitted as sufficient.

Bills and check-rolls constitute the main part of the accounts in this case, and are the only kind necessary to mention at present. When an account is left with the Auditor General for settlement, and an error is detected, or an omission of one of the requisitions above mentioned, it is suspended until the disbursing officer makes the necessary correction, or produces satisfactory evidence of the correctness of the account, and the impossibility of complying with the usual requisitions.

The system introduced by those having charge of the work, during the repairs of the breach on the Juniata line, in 1838, in keeping accounts, time of hands, and disbursement of money, is well calculated to defy satisfactory investigation. One set of men kept the time of hands and teams, and, as a general rule, a different name was inserted on the check-rolls returned by foremen or legal time-keepers, who, so far as could be ascertained, were, in many instances, unacquainted with the facts, being often absent from the work, and sometimes never having seen the check-rolls, until presented them for their deposition and signature.

The first payment on the line was made by Mr. Steel in person, who subsequently was content by merely cashing such vouchers as were presented him, purporting to be for expenditures on the "break;" or, what was perhaps still more common, by advancing money to supervisors, foremen, clerks, and others, who were entrusted with the settlement of the accounts, the payment of the hands, and bills for which they received a credit from Mr. Steel. This system placed the greater part of the entire expenditure, under the immediate control of a great number of persons, not one of whom was or could be recognized by the State as a disbursing officer: as they had neither given bond to, or received money from the Commonwealth, nor taken an oath of office, and therefore could not be recognized as officially responsible to this department, in conformity with the resolution under which the investigation is made.

A new and extraordinary system of furnishing provision, and boarding hands, was also introduced. The provision was all paid for and returned by bill, and yet the hands were required to receipt upon the check-rolls for thirty cents per day more than they actually received; and as this was not universal, some men having their families on or near the line, and boarding themselves, it is beyond the reach of ingenuity to ascertain the correctness of the vouchers.

By this system two accounts have been rendered for the same thing, one by bill, the other by check-roll. The number of days for which credit is asked, is 142,214¾; which, multiplied by thirty (the amount deducted from boarders, daily wages,) makes $42,664 42½.

To balance this, Mr. Steel in a settlement and statement of an account made by the late Auditor General, and balance struck as left with me and explained by that officer, charges himself with $22,387 91: leaving a balance of $20,276 51 unaccounted for. To this account should be added the provision sold from the public shantees, to persons who boarded themselves or any portion of the hands,

blacksmith's bills, horse feed retained off teamsters bills; sale of lumber and other State property; pay for the time hands and teams were hired to farmers, iron masters and others; the bills charged for boarding in addition to the check-rolls, when men were on the work, and the tavern bills, and other expenses of those absent from the work, as charged by bill. For this deficiency, Mr. Steel assigned no reason other than the allegation, that the several supervisors and others, appointed by him to pay the hands did not return more. He rendered no book or satisfactory account of this item. According to his representation, a part of those employed to disburse the money, were permitted to return their accounts to him on a slip of paper, with figures only for the gross amount and a part verbally, the names of the persons from whom it was retained not being returned in either case. In this item Mr. Steel's testimony does not agree with his account, as filed in the Auditor General's Office, nor his account current made out by himself. His testimony makes the amount received for boarding $949 69 more than accounted for in his statement returned.

The department of "Commissary General of supplies," as it was called, is still, if possible, more difficult to understand. In this department a number of persons were employed as principals or agents, and as many of the bills were made out in the names of the purchasers, who in many instances cannot now recollect of whom they made the purchase, it was found utterly impossible to follow up the claim or judge of the correctness of the vouchers.

David M'Murtrie, Jr., who was appointed to take charge of this branch, says that Mr. Pennypacker, one of the Canal Commissioners, authorized him to keep the account and bills in this way. To the correctness of many of these bills, Mr. M'Murtrie is the only person that certifies.

Neither Messieurs Steel nor M'Murtrie acted under the obligation of an official oath, heretofore considered requisite with disbursing officers on the public works. How far Mr. Steel can be sustained in his conclusion of the correctness and validity of the vouchers lifted and returned by him, is a question which can only be determined by the Legislature. That there is an error in the accounts filed, appears from the face of the papers, nor does it require any other testimony to establish the fact. By adding the entire amount of the subsistence account together as returned by bill, each individual for whom credit is asked, including men, women and boys, are made to use four and a-half pounds daily, or more than twice the weight used by the United States army.

If the number of days represented by the twenty thousand dollars retained by Mr. Steel be deducted, each person left on the line would have to eat and drink more than eight pounds daily, to consume the entire amount for which charge is made. As some of those entrusted with the disbursement and final disposition of the public property, or property purchased with the money had from the Executive and the Banks, still have a large amount in their hands not "fairly expended" for the use of the Commonwealth, it might be a question how far the

resolution would warrant the payment to the banks, of money still in their possession. It is found, upon examination of the accounts as rendered by himself, and settled by the late Auditor General, that there still is in the hands of Mr. Steel $5,921 45

To this must be added, ($949 69) received by him for boarding, and not returned in his account, $949 69

John Whittaker sold State property to the amount of $252 13½

To which may be added the amount received by him from the Governor, $1,000 00

Nicholas Hewit has, according to the testimony, a large amount in his hands for which he refuses to give an account. He sold all the property on the line after the work ceased, except the $252 13½, sold by Mr. Whittaker. The tools and kitchen or shantee furniture cost $9,219 38. The sale made by Mr. Whittaker deducted from this, leaves $8,967 24: making in all, in the hands of three men, $17,090 52.

In this calculation I have probably marked the property higher than Mr. Hewit sold it for, or worth to him if retained; yet as he has possession of the only evidence of the amount in his hands, which he positively refused to render, it will become necessary to charge the entire amount found, leaving it to him to show the fact. In addition to the above sales of light or movable articles, Mr. Hewit sold a large amount of property along the line, such as lumber, shantees, boats &c. of which, without his aid, no accurate account could be had.

The above may not be all the money in the hands of the numerous individuals engaged in the disbursement of the money on that line; yet it will be sufficient to call the attention of the Legislature to the subject.

Another extraordinary fact that presents itself to the inquirer, is the discrepancy between the message of the Executive, in relation to this matter, and the testimony of the disbursing officer.

Governor Ritner says in his message, "The whole work will cost, when completed, three hundred and eighty thousand dollars, of which three hundred and thirty thousand dollars have been, or will be received from the Bank of the United States," "and fifty thousand dollars from the Harrisburg Bank."

At a subsequent examination, Mr. Steel stated that he received from the banks only $301,750, and $14,000 from the Governor, making in all $315,750. It appears that the Governor gave to Alexander M'Connell $3,000, and to John Whittaker $1,000; but as there is no evidence that the two latter sums have been expended on the "break," they cannot be added to the first two, and is supposed to be in the hands of those two gentlemen, at the disposal of the late Executive, the banks, the Commonwealth, or any one having a claim to it, at least so far as Mr. Whittaker is concerned, according to his own declaration. If these $4,000 belong to the Commonwealth, it will make the whole amount, had from the banks and the Governor, $319,750: the entire amount believed to have been had by every and all persons engaged on that line of canal during the "break."

Whether the excitement of the times had confused the Governor's recollection, or the message had been written prior to a knowledge of all the facts, now remains problematical.

One of the evils that has arisen from the misapprehension of the Governor, is the fact that his message led the Legislature to authorize a loan for a much larger amount than it appears will be necessary to pay the banks: thus subjecting the State to unnecessary interest.

The above facts, being in testimony a statement in writing, was sent to Mr. Steel, informing him of the nature of the testimony, and the difficulty of settling the accounts without farther evidence, and again inviting him to my assistance in the settlement thereof, leaving it to him to fix such time as would best suit his convenience. To this proposition, I received no reply. All hopes were now abandoned of being enabled to comply with all the requisitions of the Legislature, embraced in the resolution.

As it was an object to arrest the interest, at as early a period as possible, it became a question how far I would be warranted in applying the money, loaned for that purpose, to the payment of the banks specified in the resolution.

For the purpose of ascertaining, from the legal authority, the extent of the powers delegated, I addressed a letter to the Attorney General, to which I received the following reply:

—

ATTORNEY GENERAL'S OFFICE,
Harrisburg, Sept., 18, 1839.

GEO. R. ESPY, Esq.,
Auditor General:

SIR:—I had the honor to receive your letter dated yesterday, requesting my "official opinion in writing," upon the construction of the Resolution relative to the moneys borrowed to repair the breach in the Juniata Division of the Pennsylvania Canal," approved the 2d day of July, 1839, as to whether, in case the accounts, mentioned in said Resolution, cannot be audited and settled according to the provisions and requisitions of the same, on account of their informality, incorrectness, or otherwise, you would be justified in drawing a warrant in favor of the banks therein mentioned, for a part, or the whole of the amount stated in said Resolution. It is not so easy, as at first glance might be imagined, to ascertain the true sense of the foregoing Resolution. If it was the intention of the Legislature to confine the investigation of the Auditor General strictly to the "accounts and vouchers" produced then, it is very clear, that if none of them can be allowed and settled, on account of informalities, inaccuracies, or other causes, no warrants for any part of the sum mentioned, could be drawn by you. In that view of the subject, the accounts and vouchers are the only evidence that any money whatever has been "fairly expended;" and if they fail of obtaining allowance, the only evidence of the fact of expenditure, on which you are

authorized to act fails, and, of course, no warrants ought to be drawn. The whole subject stands as it did before the passage of the Resolution. But the Legislature proceed to say that you, as Auditor General, shall draw your warrants in favor of the two banks named, for such sums as you shall find to have been fairly expended in repairing said breach;" and if you shall not find a sum equal to $380,000, the amount borrowed from said banks, to have been fairly expended, then the payments to be made to said banks shall be *pro rata*. It would seem from these provisions that the Legislature did not intend to confine your inquiries to the accounts and vouchers produced, but that you might "find what sum had been fairly expended" by other means, and when so found, should draw your warrant for the same.

It is to be remarked, that if the accounts and vouchers are not such as are recognized by law, no presumption can arise in favor of the correctness of any item therein contained, and the whole must be regarded as void. You will then turn your attention to other proof of what amount of money has been "fairly expended;" and if none such exists, or has been submitted to you, I know not on what principle you can make any presumption on the subject. I think it is your duty to hear whatever proof is offered at a proper time, in a proper manner by the banks, or accounting officers concerned, showing the amount fairly expended in making said repairs, but until the production of this evidence, you cannot possibly ascertain the amount "fairly expended in repairing said breach," nor draw your warrant for the same. It would seem to be left to your discretion, to procure or hear the evidence, independent of the accounts and vouchers, in such manner as you may deem fit.

Yours, with respect,

OVID F. JOHNSON,

Attorney General.

As this opinion clearly denies the right to draw for any portion of the money prior to the finding of the particular items of expenditure to which it was to be applied, I was compelled to adopt the only alternative: that of referring the whole subject again to the Legislature.

When the investigation commenced, no doubt was entertained of a speedy compliance with the wish of the Legislature, and it is with feelings of deep regret I am compelled to refer it again to that tribunal. Committees from each House having had the subject under consideration for more than four months, without being able to arrive at any satisfactory conclusion, was an additional reason to me why nothing should be left to chance, or the accounts passed on without a full and clear understanding of the same. The inference would seem to be, that the committees at least suspected, what has since been partially substantiated by evidence, and which renders the vouchers of little or no use in the final settlement of these accounts. Not one fact can be clearly proved from the papers, as rendered, relative to the correctness of the accounts, unless it be in those for the pay of officers

engaged on the work, and many of them are uncertain if a strict compliance with rule is adhered to, as the Resolution only recognizes those who have been provided for by law or custom.

If the Legislature should come to the conclusion that the vouchers, as filed in the Auditor General's Office, cannot be admitted as good evidence of the amount of money "fairly expended" for the use of the Commonwealth on that breach: a serious question will be presented, —in what way can that fact be now ascertained?

With due deference, I would beg leave to suggest the appointment of one or more practical Engineers, with power to examine witnesses, and directions to measure the work, with a view to the cost of repair, in accordance with the best evidence in relation to the extent of the damages, at the different points on the line, making liberal allowance for the nature, time, and manner of the work, and to make report of such examination and estimate to the Legislature, which, after deducting the amount unpaid, can be awarded to the banks, or so much thereof, as may be necessary to pay them. The extent of the breach can be pretty clearly ascertained. I am informed that a number of experienced and practical men examined the entire line, immediately after the break occurred, some of whom yet have their notes and calculations, made at that time, with a view to ascertain the extent of injury, and the cost of repairs.

It is due to many persons, residing near that line, to state, that a large amount still remains unpaid. No part of the expenses of the month of December has been paid, and many older accounts are still outstanding. The testimony was first written out as delivered, and afterwards carefully read over to the witness who made such alterations or corrections as he thought proper, previous to affixing his signature, excepting two or three instances, where the testimony is not signed, the witnesses having left without my knowledge, or before the testimony was concluded, to the accuracy of which the clerk can testify.

Having carefully re-examined the testimony, herewith submitted, in connexion with the accounts, as filed in the Auditor General's Office, I submit the following additional reasons why the accounts are suspended:

1. Because time is charged for work which was not performed.

2. Because teams are charged in the names of persons who had no teams on the work, and in some instances, the amount of which is receipted without the knowledge or consent of the person in whose name the account was kept.

3. Because teams were charged at full and high prices, and the driver's time charged in a separate account.

4. Because foremen were partners in teams: one keeping time principally by bill, the other by check-roll—oftentimes not in the owners name.

5. Because public teams and hands were freely donated to the use of private individuals and political partizans—their time being continued on the check-roll.

6. Because a large amount of money is charged for getting on hands, while others were discharged for opinion's sake.

7. Because improper time was added to the check-rolls, at the will of those having charge, to cover the expense of bringing hands from a distance, and a large amount returned by bill for the same thing, rendering it impossible to ascertain what has been charged for this item, or what number of days' work ought to be deducted.

8. Because time is continued for hands and teams after they had left the work.

9. Because articles never purchased for, or used on the work, are charged in the account.

10. Because many persons were induced to receipt for money which they never received, and to which they had no claims.

11. Because bribery was attempted for the purpose of procuring the public funds.

12. Because public property was converted to private use.

13. Because lumber and other articles were purchased, to be delivered on the line, at a given place, and fixed price, as rendered per bill, and the contractor permitted to charge the Commonwealth with the daily pay of the teams employed to deliver it; and, at least, in one instance, two dollars per day was charged more than the teamster received, notwithstanding they were principally paid out of the contractor's store.

14. Because foremen and other hands bought materials, provision and tools; settled accounts, sold property, or converted it to their own use, and had control of the boarding houses.

15. Because horse feed is charged to the Commonwealth, in addition to full pay for time.

16. Because officers and hands received pay, and had expenses paid while travelling in different parts of the State, vicinity of the work, or in attending elections.

17. Because many persons were hired at high prices, who were neither foremen, mechanics, nor even laboring men.

18. Because foremen and others, while in the public service, bought and slaughtered cattle, using the State teams and hands for that purpose, and supplying the line with meat by the pound, at a high price.

19. Because public officers, having sold public property, now refuse to render an account, or even a bill of sale.

20. Because materials, provision, &c., were not, at all times, procured at as low prices as they were offered at.

21. Because provision (at least flour) fell in price after the "break," while the charge is continued, at the most advanced prices, to the Commonwealth.

22. Because one of the supervisors charges for three yoke of oxen for months, at twelve dollars per day, exclusive of the driver, when

it appears he had but two yoke, and for weeks in succession, but one yoke of oxen on the work; and because six dollars and twenty-five cents per day is charged, by the same person, for a two horse team, including the driver, which team and driver were employed, in private use, a great part of the time.

23. Because the blank check-rolls furnished by the State, upon which accounts are kept, were mutilated. The heading and certificate below being cut off, and others attached by wafers, or otherwise capable of easy separation, and leaving it uncertain how many were attached when sworn to; whether teams at six or eight dollars were not substituted for hands at ninety-five cents per day, or whether one individual may not have signed for others?

24. Because a large amount of whiskey is charged to the Commonwealth.

25. Beccuse the disbursing officer could not, or would not correct the accounts returned by him; and because I could not designate the true from the false vouchers, or ascertain the amount "*fairly expenp-ed*" on the breach, as directed by the Resolution.

After a careful and tedious examination of the vouchers, in connexion with the testimony, I cannot, in the faithful discharge of my duty to the Commonwealth, be satisfied that the amount of money borrowed, has been "fairly expended" on that line.

Perhaps, in the examination of public accounts, it would not be a duty to require all that strict legal evidence required in a court of justice; yet it cannot be doubted that one who is entrusted with the scttlement of the public accounts, should demand sufficient evidence from the disbursing officer, to convince the mind, that the amount for which credit is asked, has been properly applied to the use of the State.

In the present case nothing has been shown or presented me, to warrant the belief, that the sum borrowed by the late Executive, or a reasonable proportion thereof, has been "fairly expended" in the repair of the canal between Huntingdon and Hollidaysburg, or for the benefit of the Commonwealth.

The facts elicited will, it is trusted, satisfy the Legislature of the necessity and propriety of the course taken, and the impossibility of complying with their requisitions contained in the Resolution.

All of which is respectfully submitted,

GEO. R. ESPY,
Auditor General.

Note.—The following correspondence will show the Legislature the amounts severally claimed by the Banks.

HARRISBURG BANK, *Nov.* 1, 1839.

GEO. R. ESPY, Esq.
Auditor General:

DEAR SIR:—In reply to your letter of the 29th inst., addressed to the President of this Institution, I have the honor to state, that on the 30th of June, 1838, a loan was made to the late Executive of fifty thousand dollars, to be applied to payment of repairs of the Canal between Huntingdon and Hollidaysburg. Forty-eight thousand seven hundred and fifty dollars of which was drawn out of the Bank—the balance, say twelve hundred and fifty dollars, applied to payment of six months' interest.

Very respectfully, &c.
H. WALTERS,
Cashier.

—

BANK OF THE UNITED STATES,
October 31, 1839.

GEO. R. ESPY, Esq.
Auditor General, Harrisburg:

SIR:—I enclose by direction of the President, in compliance with the request, contained in your letter to him, dated 29th inst., an account of the moneys advanced to the Commonwealth for canal repairs on the drafts of the late Governor, amounting with interest to this date, to two hundred and eighty-two thousand four hundred and seventy-six dollars ($282,476.)

I am very respectfully,
Your ob't. servant,
A. SARDNER,
2d Assistant Cashier.

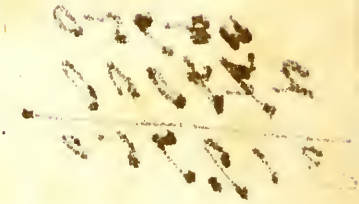
The Commonwealth of Pennsylvania,
To the Bank of the U. States, Dr.

For moneys advanced to the Commonwealth on the Checks of the Governor for Canal repairs, viz:

July 27, 1838, To cash paid Gov. Ritner's check			
dated		25th July,	$50,000
Oct. 2,	"	28 Sept.	26,000
" "	"	29 "	50,000
" 29	"	26 Oct.	50,000
" "	"	" "	53,000
Dec. 4	"	1 Dec.	42,000
			$271,000

Brought forward,									$271,000
Interest at 4 per cent. to October 31, 1839, viz:									
					Y.	M.	D.		
On $50,000	from	27 July,	1838,	is	1	3	4	$2,522 22	
" 76,000	"	2 Oct.	"		1	0	29	3,284 89	
" 103,000	"	29 Oct.	"		1	0	2	4,142 89	
" 42,000	"	4 Dec.	"		0	10	27	1,526 00	11,476
									$282,476

48-95-0
2,74000
319,376-0



ANNUAL REPORT

OF THE

CANAL COMMISSIONERS,

TO THE

GOVERNOR OF PENNSYLVANIA,

WITH THE ACCOMPANYING DOCUMENTS,

For the Year Ending October 31, 1839.

READ IN THE HOUSE OF REPRESENTATIVES, JAN. 23, 1840.

HARRISBURG:
HOLBROOK, HENLOCK, & BRATTON, PRINTERS.
.....
1840.

REPORT.

CANAL COMMISSIONERS' ROOM, STATE CAPITOL,
Harrisburg, January 21, 1840.

His Excellency, DAVID R. PORTER,
Governor of Pennsylvania:

SIR:—By order of the Board of Canal Commissioners, I have the honor of transmitting to you their annual report, for the year ending on the first day of November last, and accompanying documents.

I am yours,
Respectfully,
JAMES CLARKE, *President.*

The Canal Commissioners respectfully submit the following report:

On the first day of February last, the present Board of Canal Commissioners entered upon the discharge of their official duties. The condition of the public works at the time they were confided to their hands, was fully presented to the Legislature, in their report of the 11th March, and the accompanying documents. From the high professional character of the gentlemen appointed to examine the several canals and railroads, whose reports were transmitted to the Legislature; and from the specific detail of their estimates, we then expressed our confidence in the accuracy of their statements, and the soundness of their general views. Subsequent examinations, and the progress made under the limited appropriations of the last Legislature, in executing the repairs, have proved that they were not over estimated. The improvements, it is true, have been kept in a condition fit for public use, by the expenditure of a much less sum than that asked in our report of the 11th March, but the necessity of the repairs then recommended, has not been avoided. Procrastination has but increased that necessity, and augmented the sum required to accomplish the object.

The policy which actuated the last Legislature in withholding the

sums absolutely required to place the public works in repair, was surely injudicious. So far as the public works completed are concerned, true wisdom requires an anxious and scrutinizing examination of their condition; and sound economy an abundant and timely provision for keeping them uninterruptedly in use.

The Board, in their report of the 11th of March, before referred to, stated that the whole amount required for repairs, according to the estimates of the engineers, was as follows, viz:

Columbia railroad,	$51,242 00
Eastern division,	56,887 00
Susquehanna division,	74,570 00
Juniata division,	176,000 00
Portage railroad,	48,500 00
Western division,	83,034 00
Beaver division,	47,880 00
French creek division,	236,500 00
West Branch division,	102,555 00
North Branch division,	178,224 00
Delaware division,	70,369 00
Total amount,	$1,125,761 00

They also at the same time reported, that to these estimates of repairs might be added, the following items of expenditures on the Columbia and Portage railroads, required to put them in a fit condition for public use, as would appear by reference to the reports of the engineers, viz:

For renewing north track of Schuylkill plane with T rails,	5,632 00
For renewing north track of railroad from Schuylkill plane to Paoli with T rails,	262,672 00
For T rails at Maul's bridge and completing embankments,	11,952 00
For renewing track through gap at Valley Hill with T rails,	18,975 00
For laying permanent track with T rails on inclined planes at Portage railroad,	110,000 00
For ropes at planes on Columbia and Portage rail roads,	27,000 00
For locomotive engines,	117,000 00
Whole amount required,	$1,678,992 00

When that report was made, the Legislature was surprised with the magnitude of the sum required; that it was large, could not be denied; but the Board felt it to be their imperative duty to present the true condition of the public works, whatever might be the sum required to put them in complete order. The duty of general super-

intendance devolved by law upon this Board, and in view of the vast expenditures of public money in their construction, the extent of business, and immense pecuniary interests which would be deeply affected by a suspension of their use, the Board could not, under a sense of its high duty to the country, conceal, year after year, from the people and their representatives, a state of things, the existence of which was evident. They would deem themselves unworthy of the trust committed to them, if guilty of such a dereliction of duty; and, however painful the exposure, they could not evade the responsibility. They preferred to meet it at once. The true state of the public works is before the country—the necessity of speedy and thorough repair evident, and hence the duty of this Board is performed. It was for the Legislature to furnish the means or to incur the responsibility of hazarding a suspension of business, and consequent loss of the revenue from the canals and railroads of the commonwealth.

The Commonwealth has now completed and in operation 726¼ miles of Canals and Railroads, as follows:

	MILES.
Delaware Division—extending from Bristol to Easton,	59¾
Columbia Rail Road—extending from Broad and Vine sts., Philadelphia, to the Basin, at Columbia,	82
Eastern Division—extending from Columbia to the junction of the Juniata and Susquehanna Divisions on Duncan's Island,	44½
Juniata Division—extending from the junction at Duncan's Island, to the Basin at Hollidaysburg,	127½
Portage Rail Road—extending from Hollidaysburg to Johnstown.*	36
Western Division—extending from Johnstown to the Monongahela river, at Pittsburg,	104¼
Beaver Division—extending from the Ohio river, at the mouth of Beaver, to the head of slack water on the Shenango, six miles above New Castle,	30¾
French Creek Feeder—extending from the head of navigation in the pool of Bemus' Dam, three miles above Meadville, to the junction with the Erie Extension, including the Conneaut Lake,	27
Franklin Line—extending from the Feeder Aqueduct, seven miles below Meadville, to the town of Franklin, on the Allegheny river,	22¼

* The railroad is 264 perches longer than stated above; running parallel with the Basins at Hollidaysburg and Johnstown, the distance is counted in the Canal only.

	MILES.
Susquehanna Division—extending from the junction at Duncan's Island, to Northumberland,	39
West Branch Division—extending from Northumberland to Farrandsville,	73
North Branch Division—extending from Northumberland to Lackawana,	72½
Bald Eagle Side Cut—extending from pool of Dunnstown Dam, on the West Branch Division, to Bald Eagle creek,	3⅝
Lewisburg Side Cut—extending from Lewisburg to the West Branch Division,	⅝
Lackawana Feeder—at the termination of the North Branch Division,	¼
Allegheny Branch of the Western Division, in Allegheny-town,	¾
Feeder at Johnstown, on the Western Division,	1½
Feeder at the mouth of the Raystown Branch of the Juniata,	1
Whole number of miles of Canal and Railroad, completed,	726¼

In addition to which, several feeders, not navigable, have been constructed by the State, among the most important of which may be named the feeder at Hollidaysburg, three miles and a quarter in length, and the Swatara feeder, two miles in length.

The length of the lines of Canal now in progress is as follows:

	MILES.
North Branch Division—extending from the Lackawana river, to the village of Athens,	90
Erie Extension—commencing six miles above New Castle, and terminating in the harbor of Presque Isle, at Erie,	105½
Wisconisco Canal—extending from the Wisconisco Creek to the Towing Path Bridge, at Duncan's Island,	12¼
Total unfinished lines in progress,	207¾
Canals and railroads in operation,	726¼
Whole number of miles of Canal and Railroad in progress and completed,	934

The length of public improvements under contract, to which no appropriation was made by the act of the nineteenth of July last, is as follows:

	MILES.
Sinnemahoning Extension of the West Branch Division,	33
Kittaning Feeder,	14
Gettysburg railroad (that portion upon which grading has been commenced,)	22
Total suspended,	69

A glance at the map of Pennsylvania, exhibits a surface of country beyond almost any other State in the Union, diversified by parallel chains of high mountains, deep valleys, and various rivers. The foregoing canals and railroads, either penetrate these mountains, or pass over them in various directions, as well as follow the courses of the rivers and streams, and cross them in many places. A system of public improvements, as extensive as ours, and constructed at so great an expenditure of public money, is without a parallel. It must strike every one with astonishment, who considers that they were undertaken by a plain and economical republican community, consisting of a little upwards of a million of people, and carried through entirely upon the pledge of its credit, and its faith. The enterprise and boldness of the undertaking, can only be equalled by the magnitude of the benefits which must ultimately result from the entire completion of our system of public improvements, as originally projected. Our rich agricultural valleys of the interior; our hills and mountains, in which lie embosomed unequalled masses of coal and iron, together with our forests of valuable timber, have, by means of this system of improvements, been brought within convenient reach of market, and enabled the citizens of this commonwealth to realize their inestimable value. While it is to be deeply regretted that, in the infancy of the system, many works were commenced, from which little immediate benefit is to be expected, and some of the utmost value were constructed, not upon the soundest and most economical plan, we are encourged by the consoling reflection, that the error of the system has been one of too high and too sanguine a spirit of enterprise, generous and patriotic in its purposes, and that once constructed, these works are to stand for ages, and to become the invaluable inheritance of those on whom the unliquidated portion of the debt, contracted in their construction, is to be thrown. No man can have witnessed the rapid advance of Pennsylvania in population, prosperity, and general resources, during the last few years, without being convinced that our public debt, however great may be its amount, or the immediate embarrassments attending it, will rest but lightly on the shoulders of the people, when a reasonable time is given for the public improvements to go fully into operation. It will not be denied by any one, at all familiar with the circumstances, that our canals and railroads, and the aggregate increase of the value of the real estate of the Commonwealth, even now considerably exceed the whole amount of the public debt. If this be so, already, how much more must they exceed the amount of that debt, when innumerable coal and iron regions now untouched, shall have been develo-

ped, the agricultural resources of the State, multiplied, as they must be, to a great extent, our population increased ten fold, and the hum of industry, the hammer of the artizan, and the manufactory propelled by steam or water power, be heard throughout every dell and valley of this wide extended Commonwealth.

In considering the present condition of Pennsylvania, these things must be taken into the estimate. Experience shows that this is not a picture of the fancy. What has been stated, is daily unfolding itself to our view. It is but simple justice to the founders of our improvement system, to judge of its utility by the consequences it produces. We owe this no less to them, than we do to ourselves, and to those who are to come after us. We discredit our own industry and enterprise, as well as theirs, by supposing that the opportunities of improving our condition, adding to our wealth, and multiplying our population, afforded by the completion of this system, are to be idly surrendered or thrown away. Every consideration of self-interest, of state pride, and of patriotism, will impel not only the present, but future generations, to make such use of these improvements, as will render them most available. While the states on our northern and southern borders are straining every nerve to seize upon the trade of the west, and the southwest, the citizens of Pennsylvania will not sit slothfully down and see the immense products of the great valley of the Mississippi, the Missouri, and of that chain of inland seas, stretching almost across this entire western continent, drained from their own public improvements, to enrich the treasuries of the neighboring states. That spirit of enterprise, of boldness, and of inflexible perseverance, that has thus far characterized the citizens of this Commonwealth, under embarrassments and amidst discouragements that would have subdued the energies of almost any other people, will continue to animate their efforts, and to retain for them what they have fairly won—the trade and the gratitude of those remote regions, that find the improvements of Pennsylvania their direct highway to market.

We proceed now to give a particular statement of the condition of the several lines of canal and railroad under our supervision:

DELAWARE DIVISION.

This division of the public works has been peculiarly unfortunate during the present season. On the 27th of January last, the Delaware, at Easton, rose to the unprecedented height of twenty-two feet above low water mark, overflowing all the low levels of the Canal, sweeping off aqueducts, destroying the banks, and in many cases filling the entire Canal with earth. The Lehigh was also higher than it had ever been known,—overflowed the guard banks of the dam at Easton—swept entirely away the southern abutment, and thus left the dam in a most critical situation. Great credit is due to the spirited inhabitants of Easton, for the prompt and energetic measures adopted by them at the time of this disastrous flood, to prevent

the threatened destruction of the most expensive portion of that line of canal. Men and means were procured upon personal responsibilities, and public spirited individuals were found, who braved the inclemency of the weather, and devoted their labor and energies to protecting the interests of the Commonwealth.

On the 8th of April, another flood occurred, quite as high as the first, and nearly as disastrous to the public works, except that the mechanical work was not so much injured. Owing to the time necessarily spent in repairing the breaches occasioned by these overwhelming freshets, navigation did not open on the Delaware Division, until the 14th of May, since which time, it has, however, been but litule interrupted. It is a source of gratification to the Board, to be able to state, that the business done upon that line of Canal, notwithstanding these untoward circumstances, has, during the present, exceeded what has ever been done in any former year.

Upon a careful examination of the dam at Easton, after the destructive floods, it was deemed most prudent to abandon the idea of a thorough repair, and arrangements have accordingly been made for the construction of a new dam. The site selected is immediately below the former one, in the excavation made by the overfall, thereby securing a rock foundation, and having also the advantage of a connection with the old structure. The work has been allotted to a responsible contractor, and is estimated to cost $28,021 00.

The length of the Division is fifty-nine and three-fourth miles, upon which the total rise from mid-tide, at Bristol, to the top-water level of the dam at Easton, is one hundred and sixty-four feet. The height of the dam is eleven feet and seven-eighths above low water in the Delaware. The entire rise is overcome by twenty-three Lift Locks, varying in height from six to ten feet. There are upon the line, nine aqueducts, twenty culverts, and one hundred and five bridges; and in addition to the Lift Locks, two Guard Locks, one Out-let Lock, and one Tide Lock, at Bristol. The line was first filled for navigation in October, 1830. The wooden superstructures having been in use nine years, and consequently much decayed by the exposure to which they have been subjected, will generally have to be renewed during the ensuing season, arrangements for which have already been made, and the contracts allotted. Their prosecution, however, will mainly depend upon the provision which may be made by the Legislature for carrying on the work.

From the immense amount of tonnage which will be thrown upon this Canal, by the extension of the Lehigh Navigation, twenty-six miles above Mauch Chunk, through the heart of the coal region, and the railway now nearly completed from the Lehigh to the Susquehanna, the Board would recommend that the capacity of the Canal should be increased by widening the Locks. They are at present 90 feet in length, and but 11 feet in width, which will only admit the passage of boats of about sixty tons burthen, while the water line of the Canal is forty feet, and its depth five feet, sufficient to pass boats of 100 tons burthen, if the Locks were 90 feet long and 17 feet wide,

the size of those upon the Susquehanna. It may, however, hereafter become necessary to enlarge the capacity of the entire Canal, to enable it to accommodate the increased business which will unquestionably be thrown upon it by the numerous companies concerned in the vast coal and pine regions of the Lehigh, and the tonnage which may be safely calculated upon from the Lehigh and Susquehanna, and the Cattawissa railroads.

The floods of last winter and spring, proved, conclusively, that the Canal banks, at many points on the upper portion of the Delaware Division, are entirely too low,—and to avoid similar disasters hereafter consequent upon so low a location, the Board would suggest the propriety of an immediate provision by law for raising the banks to such height, as would effectually prevent their recurrence.

For a specific statement of the amount required for repairs the ensuing year, and a minute detail of the transactions upon this division during the present season, the attention of the Legislature is respectfully referred to the report of W. K. Huffnagle, Principal Engineer, herewith submitted.

The following estimate shows the sums required, viz :

Repairs of locks,	$20,826 68
Waste-weirs,	4,794 08
Bridges,	1,940 77
Dams,	29,804 76
Aqueducts,	5,149 38
Weigh-lock, feeder, &c. at Easton,	5,180 00
Timber,	6,830 12
Peir at Bristol, wharf, &c.,	3,500 00
Raising banks and repairs to wall,	15,000 00
Ordinary repairs of banks, tools, &c.,	18,000 00
	$111,025 79

The amount of tolls received on this division during the fiscal year, is	$94,695 40
The sum drawn from the Treasury for repairs during the last fiscal year, is	$90,612 71

COLUMBIA AND PHILADELPHIA RAILWAY.

This improvement is eighty-two miles in length, extending from Broad and Vine streets, in Philadelphia, to the canal basin at Columbia. The condition in which it was found, when it was placed under the direction of the agents now having it in charge, rendered extensive and costly repairs, during the present season, unavoidable; and, although by untiring exertions and the strictest attention, the road has been kept constantly in a suitable condition for public use; much yet remains to be done before it can be considered in good condition

throughout its whole extent. From the head of the inclined plane, near Philadelphia, to the intersection of the West Chester railway, a distance of eighteen miles, there is but one permanent track; the other having been laid upon timber, with the bar rail, has become decayed and unfit for use. In consequence of this, the Superintendent of motive power is compelled to start all the trains from Philadelphia at stated hours; and after half past ten o'clock in the morning, cannot permit a train to leave that point until all the trains from Columbia have arrived; which, if detained by accident or otherwise, do not get through until late in the evening. But few repairs have been made on the north track, such only as were required to render it safe for slow travel with horse cars. Its permanent renewal with T rails, will depend on the action of the Legislature, on the propositions to avoid the inclined plane.

The track through the Gap cut has been re-laid with T rails, and substantially repaired, which will very materially facilitate transportation on the road. The grade at this point is forty-five feet per mile, for three-fourths of a mile on each side of the summit, and the tonnage of all engines has heretofore been regulated by the number of cars they were capable of transporting over the old track. Since the improvement, the engineer informs the Board, it has been ascertained by actual experiment, that the same propelling power will readily convey from ten to twelve tons of additional burthen.

The Schuylkill inclined plane has been a source of vexation and delay to every individual doing business on the road since it was first opened. It is two thousand eight hundred and five feet in length, having a altitude of one hundred and eighty-seven feet, and is worked by an engine of sixty horse power, and an endless rope of seven inches circumference. The capacity of the plane is about two thousand tons per day, which greatly exceeds the present requirements of the road; but the inconvenience of passing it is such, when trade is brisk, as to render it a source of constant complaint among transporters. Since the completion of the Reading and Philadelphia railroad, which connects with the State road at the foot of the inclined plane, the difficulties experienced at that point have increased, by the throng of business which is now done, between the intersection of the roads and the city. The north track of the plane is very much out of repair, it is laid upon longitudinal stone sills, which are difficult to retain in adjustment. It is proposed to relay this portion of the track, by sinking the present sills as a foundation for locust crossties, and substituting the T rails.

The Harrisburg and Lancaster railroad connects with the Columbia railroad near Lancaster, and the importance of the trade brought on to our improvements through this channel, which has been greatly increased by the completion of the Cumberland Valley railroad, is such as to justify the Commonwealth in constructing the necessary sidings and depots at the junction for its accommodation. The locomotives, after discharging their respective trains of burthen cars at the intersection, are now sent a distance of twelve miles to the Colum-

bia depot. This should be obviated by the construction of a depot at or near Dillerville, and a siding to accommodate one hundred cars.

Large expenditures have been made during the present year in repairing bridges, in adjusting the track, in ditching and draining the road, in renewing broken castings and in adding new cross-ties, a detailed statement of which will be found in the several reports of the engineer and supervisors, transmitted with this report.

The following is an estimate of the amount required for ordinary repairs during the ensuing year.

Repairs to track,	$27,750 00
Bridges,	9,570 00
Water stations,	780 00
Wood houses,	100 00
Cross-ties and castings,	10,700 00
Iron,	8,000 00
Total,	$56,900 00

ESTIMATE OF EXTRAORDINARY REPAIRS.

Depot and coal shed, at Philadelphia, for the engines on Schuylkill Level,	$7,500 00
Relaying north track on plane,	6,116 00
Relaying north track, to West-Chester intersection,	246,752 64
Track at Maulls' Bridge,	4,800 00
Track at Smiths' Bridge,	1,900 00
Wall in Parkesburg Cut,	5,000 00
Bridge at Hensall's Alley, Lancaster,	800 00
Depot at or near Dillerville, for locomotives engaged in the Harrisburg trade, and sidings,	12,660 00
To finish Lemans' Water Station,	1,250 00
Force pump and pipes, for supply of water at Schuylkill plane,	5,000 00
Rope at plane,	3,412 00
Engine and hose for shop at Parkesburg,	1,200 00
Collectors' Office at Parkesburg,	600 00
Reduction of curves on old line,	10,000 00
Total amount required for extraordinary repairs,	$306,990 64
Total for ordinary repairs,	56,900 00
Total amount,	$363,890 64

Since closing our annual report, the engine house, smiths-shop, and fixtures at the head of the inclined plane, near Philadelphia, were destroyed by fire.

Arrangements were promptly made for replacing them; and, at

this time, they are nearly completed. This disastrous occurrence turned the attention of the Board to the exposed situation of the machine shop, at Parkesburg, in case of fire. and induced them to direct the purchase of an engine, and suitable hose, for its protection.

The amount drawn from the Treasury, for repairs on the Columbia and Philadelphia Railroad, during the fiscal year, is $69,384 35.

The fifth section of the act of the 19th of July, 1839, authorizes the Canal Commissioners to enter into negotiation with certain railroad companies, and ascertain upon what terms each of said roads can be purchased by the Commonwealth, for the purpose of avoiding the Schuylkill inclined plane. This duty has been attended to, and will be made the subject of a special report to the Legislature.

MOTIVE POWER.

The present Superintendent of motive power on the Columbia Railway, in taking charge of that department, had many difficulties to encounter, owing to the bad condition of the road and locomotives, at the inclement season of the year they were placed under his management. Instead of finding twenty-seven engines in excellent repair, as stated by the late Superintendent in his annual report, the Board are informed by the officer who succeeded him, that but six could be found at all fit for use. Measures were, however, immediately adopted to repair the engines, and instructions were given to the Superintendent to buy such new ones as might be necessary to accommodate the business of the road. Under this authority, eleven new locomotives were contracted for. Three were purchased from Peter Wager and J. R. Hassinger, manufactured by Henry R. Campbell, Philadelphia; two from D. H. Dotterer & Co., of Reading; two from Ross Winans, of Baltimore; two from William Norris, and two from Baldwin & Co., Philadelphia. There are now thirty locomotives in service on this road, of which fourteen are first class engines, weighing thirteen tons, and are each capable of propelling one hundred and forty tons over the road,—the remainder are second class engines, weighing ten tons. If the business should not greatly increase during the coming year, these engines will be sufficient for the use of the road. A balance beyond the appropriation of last session, for locomotives, ropes, &c., remaining unpaid, will be required, amounting to $30,000.

The attention of the Board was very early turned to the propriety of introducing mineral coal as a fuel for generating steam in locomotive engines. They directed numerous experiments to be made with anthracite coal, and the result has been highly gratifying;—we are positively assured by the Superintendent and Engineer, that perfect success has been attained. Measures have accordingly been adopted to prohibit the use of wood on this road, as fast as locomotives can be prepared for the use of coal. Five engines are now propelled by steam, generated with anthracite exclusively.

Experiments have also been made in the use of bituminous coal.

It has been found to answer admirably, when it can be had of a pure quality, free from sulphur, in masses large enough to prevent its falling through the grates, and may be successfully used in engines, originally constructed for wood, without any material alteration. Four engines are now constantly engaged on the road, that use no other fuel.

Owing to frequent accidents, safety cars have been adopted on the inclined plane, at Schuylkill, which will hereafter afford additional security to freight and passengers. They have been fairly tested on the Allegheny Portage Road, and, so far as the Board have learned, have not failed in a single instance. It is a matter of surprise that they were not sooner placed on the Schuylkill plane, where they were more needed than at any other.

It appears by the report of the Superintendent, that 52,664 cars passed over the Columbia plane, and 51,156 over the Schuylkill plane, during the present year, and that they were carried in 4239 trips over the road, making 347,680 miles travelled in the year.

The amount of motive power toll received on this road during the fiscal year, is as follows:

At Philadelphia,	$80,754 28
Paoli,	1,108 39
Downingtown,	4,488 19
Parkesburg,	4,950 73
Lancaster,	26,486 65
Columbia,	69 565 81
Total,	$187,354 05

Amount drawn from the Treasury for motive power, expenditures during the same period, $156,672 19.

The attention of the Legislature is respectfully referred to the report of the Superintendent of Motive Power, for further particulars.

The Board would recommend the repeal of the act of the 15th of April, 1834, giving to individuals the right to place cars for the conveyance of passengers on the State railroads. The carrying of passengers should be done by the commonwealth, exclusively. It would require but few, if any, additional agents, and would add to the resources derived from the road at least one hundred and fifty thousand dollars per annum. Companies derive their greatest profits from this source, and there is no good reason why the Commonwealth should not make the best use of her improvements.

ROAD TO AVOID THE COLUMBIA INCLINED PLANE.

This improvement is at length nearly completed. The grading was finished in July last, and a single track of rails transferred from the former location, has been laid. Within a few weeks, trains have

passed round the plane ; but the depot at the head of the canal basin being unfinished, the road cannot yet be advantageously used. It will be completed during the winter, so that the Columbia inclined plane may be entirely avoided by the coming spring.

The attention of the Board has been turned to the location of the road through the town of Columbia. It occupies the main street of the town, where most of the business is transacted, and when in full operation, must necessarily exclude all other travel from the street.— The grade is such as to require an embankment in some places four or five feet higher than the foot pavements, and the street is so narrow that not more than two tracks can be laid without entirely shutting up the street. The arrival and departure of the different trains cannot be arranged so as to transact the business of the road at that point on two tracks. Two modes of avoiding the evil have been suggested by the Engineer, one of which the Board believe should be adopted. They, therefore, recommend an appropriation for that purpose.

The amount appropriated by the last Legislature has been found entirely inadequate to defray the expense of completing this work.— It will be observed by the report and estimate of the Engineer, that the following sums are yet required, viz :

For balance due on grading,	$32,631 05
" " " depot,	3,622 29
" " " first track,	12,731 14
" " " fencing,	979 14
" " " materials used,	12,004 27
Amount required to complete second track,	37,960 00
" " " road back of track,	7,181 15
Contingencies and supervision,	10,710 90
	$117,819 94
Deduct unexpended appropriation,	43,984 97
	73,834 97
Add amount to alter route through Columbia,	17,310 00
Whole amount required,	$91,144 97

EASTERN DIVISION.

This division is forty-four and a half miles in length, extending from the junction of the Juniata and Susquehanna divisions at Duncan's Island, to the canal basin at Columbia. There has been no interruption to the navigation on it during the present season. The Clark's Ferry dam was slightly injured by the ice freshet of last spring. The sluice walls were carried away, and the cribbing of the dam received some injury. These have, however, been repaired in

a permanent manner. The outlet locks into the Swatara at Middletown, requiring a thorough repair, the Board directed that a single lock should be constructed in their stead, having the whole lift of the two original locks, which was seventeen feet. The chamber has been increased in length to one hundred and thirteen feet, and in width to eighteen and a half feet, in order to accommodate the river craft which passes into the canal at that point. The work is now rapidly progressing, and will be completed in time for the spring trade. Cost of construction about fifteen thousand dollars.

The lock at York Haven ferry, [No. 4,] having been for years in a bad condition, and several times partially repaired during the winter months, without any permanent benefit, the Board directed the construction of an additional lock, which has been placed under contract and will be completed for use early in the ensuing summer. The original lock may then be thoroughly repaired.

Extensive repairs will be required immediately on this division. The aqueduct at Clark's creek and Stony creek, require renewal; and those over Paxton, Conewago, Conoy and Chiques creeks, are very defective and insecure. Nearly all the locks require new gates and sheet piling.

A new towing path bridge across the entrance of the State basin at Harrisburg is required. It is proposed to substitute for the low level platforms, embankments of earth, and stone abutments for the timber trussels, which support the main bridge.

The sluice through the Clark's Ferry dam for river navigation, is much deeper than is necessary. When the water was very low last summer, it appeared to be six or seven feet deep in the schute; it is proposed to fill it up about three feet, which will ensure a plentiful supply of water in the canal, without in the least endangering the navigation of the river.

The appropriation for doubling the guard locks and lift lock, [No. 1,] on this division is exhausted, and there is still a balance due for work done, which will have to be provided for. The lower guard lock and lock No. 1, have been completed. For the upper additional guard lock, the stone had been delivered, and the pit excavated in 1838; but as the present Board could not perceive the necessity for doubling a lock which is not used one month in a year, and is now closed except when the river is so high as almost to preclude the possibility of crossing the pool of the dam, they directed the suspension of the further prosecution of the work upon it, after having secured the pit by throwing up an embankment at each end. The work done, and materials delivered, amounted to $10,398 65, which has been fully paid. The balance remaining unpaid at the other locks, will be seen by the following statement:

Final estimate on lower guard lock and lock No. 1, including iron,	$30,718 17
Amount paid by Supervisors,	23,315 96
Amount due,	$7,402 21

There are on this division fourteen lift locks, not including the guard locks, the lock into the Union canal, and the outlet locks at Middletown and Columbia. There are in addition, three locks from the pool of the Clark's Ferry dam, to the junction of the Juniata and Susquehanna divisions on Duncan's Island. The entire lockage from the Columbia basin to the pool of the Clark's Ferry dam, is ninety-four and a half feet, and from the pool to the junction, twenty-one and a half feet.

The Tide Water canal, extending from Columbia to Havre-de-grace, on the Chesapeake, having been completed during the present season, and the Wisconisco canal being in a state of forwardness, an immense increase of business upon this division, may be confidently anticipated. The Susquehanna coal trade, hitherto comparatively unimportant, will now commence with renewed energy, and will doubtless furnish a greater amount of tonnage than that heretofore derived from all other sources on the Susquehanna canals. To accommodate the increase of trade, the Board would respectfully urge upon the Legislature, the propriety of doubling all the locks on this division, during the ensuing year. If this suggestion should meet the approbation of the Legislature, an appropriation of $99,000 00, will be required to carry it into effect.

The amount required for ordinary repairs on this division for the ensuing year, is estimated at twenty-one thousand two hundred and fifty dollars.

For extraordinary repairs there will be required the following sums:

Towing path bridge at Harrisburg,	$ 2,500 00
Road and farm bridges,	11,000 00
Clark's creek aqueduct,	7,000 00
Paxton creek, do.	6,000 00
New waste-weirs,	3,300 00
Outlet lock at Portsmouth,	15,000 00
Outlet locks at Columbia,	15,000 00
Additional lock at York Haven ferry,	7,500 00
Extraordinary repairs,	$67,300 00
Ordinary repairs,	21,250 00
Whole amount required for repairs,	$88,550 00
Balance due on additional locks at Clark's ferry,	7,402 21
Total required,	$95,952 21

The amount drawn from the Treasury for repairs on this division, during the last fiscal year is $32,360 16.

JUNIATA DIVISION.

This division extends from the junction at Duncan's Island, to the basin at Hollidaysburg, and is one hundred and twenty-seven and a-half miles in length. Navigation commenced on it the 19th of March, and continued throughout the season, with but few interruptions.—One span of the Shaver's ford aqueduct, one hundred feet in length, gave way early in August last. The frame work supporting the trunk having become decayed, broke off at the piers, and the whole span fell into the river. Prompt measures were adopted to repair the breach, and on the eighth day after it occurred, boats again passed the aqueduct. Two spans of the aqueduct at Jack's Narrows require renewal, for which materials have been provided. Contracts for repairing nine of the uncovered aqueducts were entered into during the present season, and the work is progressing.

The new trunk of the aqueduct at Duncan's Island will be extended across the stream, during the ensuing winter. The appropriations for that purpose, according to the estimates of the Engineer, will be sufficient.

There are ninety-one locks on this division, overcoming 554.53 feet of lockage. They are generally built on the composite plan; and a large proportion of them must have entire new lining, new gates and sluices, before the business of another season commences. Contracts have been made for the delivery of the necessary materials, and the work will be prosecuted during the suspension of navigation the ensuing winter. Two locks require a thorough repair;—they will have to be taken down to their foundation and rebuilt.

The Board would recommend the construction of a guard lock in the Long Narrows, instead of the single set of gates now in use at that point. They are in bad condition, and much delay is frequently occasioned by the difficulty of passing them.

The waste-wiers were originally constructed entirely of wood, and a large number of them require immediate renewal. They should be repaired with stone abutments.

The superstructure of many of the bridges has become too much decayed to last another season. Contracts for the renewal of thirty-eight of the number have been entered into.

By a resolution of the General Assembly, passed the 17th day of June last, the Canal Commissioners were "authorised to put under contract, and cause to be constructed, a towing path on the west side of the river Juniata, from the dam at North's Island, to a point near, or opposite the town of Millerstown, where it is contemplated to erect a bridge, so as to make a complete slack water navigation between those points, if, in their opinion, after a personal examination of the location, in company with a practical Engineer, the interests of the Commonwealth would be promoted by such change." It was provided also, that "if the aforesaid change should be effected, the Canal Commissioners shall enter into a contract with the bridge company at Millerstown, for the construction of a towing path for the use of the

Commonwealth, in connection with said bridge." By the same resolution, it is moreover provided, "that if the Canal Commissioners should be of opinion that the interests of the Commonwealth will be better promoted by erecting a towing path to the bridge now in contemplation at Rider's Ferry, where the rope ferry now crosses, they shall enter into contract with the bridge company at Rider's Ferry, for the construction of a towing path for the use of the Commonwealth, in connection with said bridge."

In pursuance of the provisions of the foregoing resolution, the Board, in company with Mr. A. B. Warford, a practical Engineer, personally examined the proposed change of location. The distance from the rope ferry to the bridge at Millerstown, is one mile and seven-eighths, and the cost of constructing a towing path and new outlet locks, is estimated at $30,000,—when completed nothing is gained which cannot be as readily accomplished by the construction of a towing path bridge at the rope ferry. The Board had therefore no difficulty in deciding that the interests of the Commonwealth would not be promoted by the construction of a towing path on the west side of the river, from the dam at North's Island, to a point near or opposite Millerstown. They also declined entering into contract with the bridge company at the rope ferry, for the construction of a towing path for the use of the State, in connection with their bridge. While they are satisfied that a towing path bridge should be constructed at that point, they do not consider that the interests of the Commonwealth would be promoted by entering into partnership with an incorporated company to accomplish the object. Such associations uniformly result to the disadvantage of the State, and should be scrupulously avoided. The Board, in their report of the 11th of March last, recommended the construction of a towing path bridge at the expense of the Commonwealth, as a substitute for the rope ferry. Their opinions on that subject remain unchanged,—and they now respectfully ask an appropriation for that purpose:

Estimated cost,	$20,000 00

The following statement shows the estimated cost of repairs on the Juniata Division, for the ensuing year:

Cleaning out bed of Canal, and raising and strengthening banks,	$10,000 00
Repairing locks,	29,000 00
aqueducts,	36,300 00
waste wiers,	10,600 00
bridges,	9,500 00
dams,	1,000 00
slope walls,	6,000 00
Ferry at North's Island,	600 00
Whole amount required,	$103,000 00

There was drawn from the Treasury for repairs on this Division, for the last fiscal year, the sum of $49,636 31.

ALLEGHENY PORTAGE RAILROAD.

REPAIR DEPARTMENT.

The Allegheny Portage Railroad is thirty-six miles in length, commencing at the canal basin at Hollidaysburg, and terminating at the basin at Johnstown,—passing over the summit of the mountain by ten inclined planes. The elevation of the summit above water line of canal, at Hollidaysburg, is 1398.71 feet, and above the canal at Johnstown 1171.58 feet. Since the road was opened for transportation, in April last, business upon it has been uninterrupted. The whole road was in a very bad state of repair when it was committed to the charge of the present Supervisor,—eight of the inclined planes were totally unfit for the spring business, and hence it was found necessary to keep employed during the season, a strong force of hands in removing decayed timber, introducing additional cross-ties, adjusting the superstructure, clearing out drains, and removing hill slips.

The superstructure upon the inclined planes consists of timber, cross-ties and rails, and the plate bar. Having been in use about eight years, the decay of the timber had progressed to such an extent, that thorough repairs could no longer be delayed. The last Legislature having failed to grant an appropriation for renewing these tracks with T rails, as recommended in the annual report of our predecessors, and urged by the present Board, in their report of the 11th March, the Supervisor was directed to provide materials for a thorough repair on the present plan. A large number of white-oak sills, and locust cross-ties, have been substituted during the present season; and engagements have been made for the delivery, by next spring, of a sufficient number to put the planes in good repair. The expense of providing T rails, may therefore be deferred until those tracks again require renewal.

The cast-iron chairs on this road were imported from England. Experience has proved that, although in the first instance, they cost less than those made of American iron, nothing was gained in the end by the adoption of the foreign metal. It is high and brittle, and the chair light, consequently, at least one-half have failed, which have been replaced by a heavier article of Pennsylvania manufacture, and of superior quality. New chairs are also required wherever additional cross-ties are inserted. A large number of the sheaves, on the inclined planes, are so much broken, as to be useless—many have been reset the present season, and the remainder will require renewing the ensuing summer. This has increased the expense of castings.

The amount required for repairs, is estimated as follows:

Drains, adjusting track, renewing superstructure, &c.	$21,000 00
Relaying tracks on planes,	8,000 00
Castings for chairs and sheaves,	7,000 00
Slope wall, culverts, depots, &c.	3,500 00
Stacks, flues, and dwellings,	3,000 00
	$42,000 00

The amount drawn from the Treasury, for repairs during the last fiscal year, is $34,432 25.

A suitable building for a Collector's Office, should be immediately erected at Hollidaysburg; an appropriation of $2000 will be required to meet the expense.

MOTIVE POWER DEPARTMENT.

No change has been made in the motive power, employed on the Allegheny Portage Railroad, during the past season. Locomotives are used on the long levels, horses on the short levels, and stationary engines at the planes. The press of business in the early part of the season, however, induced the Board to try the experiment of passing burden trains over the road at night, which proved entirely practicable, and a system was adopted by which the road was worked eighteen hours per day. This enabled transporters to pass their trains of cars over the road in one day, an object of great importance to them, and of undoubted advantage to the State. The expense of the motive power was, from this cause, slightly increased, but too little to be estimated, when compared with the benefits accruing to other portions of the public improvements, by having all freight passed, without delay, over this important link in the chain of communication.

There are seventeen locomotives on this road, twelve of which are required to be in active use. Most of these engines were employed on the Columbia Railroad, before they were sent to the Portage, in 1835, '36, '37, and are consequently second and third rate. Some of them are much worn and shattered, three have been entirely rebuilt, and one is useless. Situated as these locomotives are, it is almost impossible to keep the proper number in good working order. The Board would recommend an appropriation, to purchase at least two locomotive engines, of the first class, to be in readiness on the opening of the road in the spring.

The very inferior quality of the ropes on the inclined planes, has been a source of continued vexation and difficulty. By the report of the Engineer, it will be seen that breaking a rope has been a common occurrence, and that extensive injury and loss has only been prevented by the almost perfect security rendered by the safety car. Upon three of the planes, new ropes have been placed within the last three months; and for five others, they have been prepared.

The remaining two will be required early in the spring. Average cost of a new rope on the plane, is $3000.

To lessen the annual expense of purchasing ropes, by preserving them from the weather, the Engineer having charge of this road recommends that the planes be roofed. He estimates the cost of roofing at three dollars per foot lineal. According to this estimate, a plane of two thousand feet in length, would cost six thousand dollars. A good roof, with little repair, will last ten or twelve years. In the opinion of the Board, the experiment is worth trying. If the Legislature concur with them, an appropriation for that purpose will be required.

During the present year, the aggregate amount of tonnage passing one way over the road, was about 60,000 tons; and the greatest amount passed in one day, about 1,500 tons. This amount is not at all equal to the capacity of the road, if the business of the country required greater exertions. The Superintendent of motive power informs us, that from actual experiments made on plane No. 8, (the longest on the line) a train of four cars, or fourteen tons of merchandize, may be passed each way in eight minutes, working the plane twenty-four hours, gives, at that rate, 2520 tons per day, and 630,000 tons per year, of 250 days.

Motive power expenses during the year,		$114,677 70
Amount of motive power toll received at		
Hollidaysburg, during the fiscal year,	$57,351 17	
Amount received at Johnstown,	32,176 65	
Amount received at Summit,	3,241 66	
Whole amount received,		92,769 48
Excess of expenses,		$21,908 22

The Board recommend the following appropriations to the motive power fund, for Portage Railroad:

Two new locomotives,	$15,000 00
Ropes for 1840,	23,000 00
Amount required,	$38,000 00

WESTERN DIVISION.

This division, extending from Johnstown to the Monongahela river at Pittsburg, is one hundred and four and one-fourth miles in length. Navigation opened on it about the 20th of March, and continued in good order throughout the season.

When the Board visited this division during the past summer, they directed the branch canals, leading from the aqueduct at Pittsburg, to the Monongahela and Allegheny rivers, to be thoroughly repaired. These works seemed to have been entirely neglected for the last few

years; large deposites had been suffered to accumulate in the canal, and the locks had become so dilapidated as to be utterly impassible. In the Monongahela branch, the depth of sand and mud was so great as to prevent the passage of the water to the river; leaving in the midst of the city of Pittsburg, a stagnant and offensive pool, endangering the health of the city. It struck the present board as a little remarkable, that the public authorities of Pittsburg should peaceably sit still for three years and suffer such a gross public *nuisance* to exist, at the peril of the lives of the inhabitants of the city, without a word of remonstrance or complaint against the administration, through whose neglect it had been occasioned. The officers now having charge of the public improvements, had scarcely signed their official oaths, before the citizens became very sensitive upon the subject, and the Monongahela branch of the Pennsylvania canal, was presented by the grand jury of Allegheny county as a *nuisance*. Had they been as *keen scented* and *sharp sighted* a year or two previous, it is probable they might have had the *nuisance* abated by those who created it.

The Grant's Hill tunnel should be extended to Fourth street at one end, and to Seventh street at the other; unless this be done, the Monongahela branch can only be kept open by frequent removal of the sand and mud, brought into the canal from the sides of the hill, by every rain. It is estimated to cost $13,500 00
From which deduct the amount appropriated, 5,000 00

Amount required to extend tunnel, $8,500 00

If the tunnel be only extended to Fourth street, the sum of $2000 will be required.

The prism of the canal on this division, throughout its whole extent, is greatly obstructed by sand bars, mud deposites, and hill slips, which appear to have been years accumulating. The present Supervisors entered upon their duties in February—in March, navigation commenced, so that but a small portion of this kind of repairs could be made last winter. It is important that the canal should, at all points, have the proper depth of water. If it be otherwise at a few places, the business capacity of the whole length of the canal, is thereby proportionably diminished. The Board have given the necessary instructions to the Supervisors to have the bars removed during the approaching winter, relying upon the Legislature to provide the means.

From the constant wave in the canal, produced by the passage of packet boats, it may become necessary to protect the inner side of the canal banks, by a slight slope wall, throughout the whole extent of the main line. The banks have already been greatly diminished in their width by the action of the water, and at points where they have been repaired by loose stone or gravel, in a few months the materials may be found in the bottom of the canal. These repairs should

be made gradually and at places where most required. If this suggestion comports with the views of the Legislature, an appropriation of $12,000 is required, which it is estimated will wall thirty miles.

There are seventy locks on this division, and four hundred and seventy feet of lockage. They were originally constructed of cut stone, laid in hydraulic cement. At many points the stone were of an inferior quality, and have failed to resist the continued action of air, frost and water. Five of the locks have so far failed, that boats can only be passed with great difficulty. The gates have to be forced open with a windlass, and the walls are in constant danger of collapsing. These must be rebuilt during the ensuing summer. It is proposed to construct the new locks along side of the present ones, which will ensure good jobs. Cut stone work cannot be laid in cement in freezing weather.

The locks upon the division, with few exceptions, require new gates and sheet filing.

The dams have been generally repaired during the present season, and are now in good order. Some gravelling remains to be done. Contracts for cribbing lower slope of dam No. 2, on the Ligonier line, and No. 3, on the Kiskiminetas and Conemaugh line, were entered into and partly executed during the present season. Estimated cost, $8.500.

The bearing beams of the aqueduct at the mouth of the Kiskaminetas, require renewal. Several other aqueducts require partial repairs.

The bridges were originally constructed on this division with wooden abutments, and generally need re-building. The board have directed the substitution of stone abutments; thirty-five have been put under contract, and twenty more will be as soon as funds are provided.

Amount required for repairs on Western division for ensuing year, viz :

Allegheny and Monongahela branches at Pittsburg,	$ 9,000 00
Completing tunnel to Fourth street,	2,000 00
Bed of canal and embankment,	17,000 00
Locks,	52,000 00
Dams, (including contracts for cribbing,)	10,000 00
Aqueducts,	4,000 00
Bridges,	27,000 00
Waste-weirs and culverts,	1,500 00
Lock houses,	2,000 00
Total amount required,	$124,500 00

The amount drawn from the Treasury for repairs on this division, during the last fiscal year is $33,895 52.

BEAVER DIVISION.

This Division extends from the mouth of Beaver creek, up that stream, to the junction of the Shenango and Neshannock creeks, at the town of New Castle, thence by slack-water six miles along the Shenango, to lock No. 1, on the Erie Extension, and is thirty and three-fourth miles in length. The lockage is one hundred and thirty-two feet, and is overcome by seventeen locks.

The surface of low water in the Ohio river, at the mouth of Beaver, is 419½ feet below the summit level of the Erie Extension, at Conneaut Lake, and 90½ feet above the surface of Lake Erie.

The completion of the Pennsylvania and Ohio Canal, which connects the public works of Ohio with those of Pennsylvania, two miles below New Castle, will render this Division an important link in the chain of improvements connecting the eastern and western waters. A direct communication will be opened by this route, between Cleveland and Lake Erie, and the mouth of Beaver on the Ohio river, and thence by the river to Pittsburg, and the Pennsylvania canals and railroads, to Philadelphia. The cross-cut canal, it is contemplated, will be open for navigation next spring, and a large amount of tonnage will be brought upon our public works, which has hitherto sought a market through other channels. Forty-three miles of the Erie Extension, reaching to the village of Greenville, in Mercer county, will also be opened in the spring, which will furnish an outlet for the trade of the Shenango valley. When the Erie Extension shall be completed, and a connection effected with the harbor of Erie, the Beaver Division will, undoubtedly, become one of the most profitable lines of canal in the Commonwealth.

In view of the importance of this line of canal hereafter, the Board, at an early day, turned their attention to placing it in a state of complete repair. Finding that the locks, aqueducts, dams, &c., could not be thoroughly repaired while the water was kept in the canal, the Supervisor was directed to suspend navigation, draw off the water, and proceed with a strong force to make such repairs, under the direction of the Engineer, as might be deemed indispensable. This was acccordingly done on the 19th of August, and navigation was not resumed until the 4th of November. During this period many important repairs were made, and a considerable amount of money expended; yet, the Engineer remarks, in his report to the Board, that the line is not yet perfect. He states that "the principal sources of difficulty, is the defective nature of the work at the locks. They were built of cut sand stone, laid in *common lime* mortar, and in the several locks that were altogether, or in part rebuilt this season, it was found that all the lime had been washed out, so that the water passed through the walls in every direction." For a particular description of the repairs on the Beaver Division, the Legislature are respectfully referred to the report of W. Milnor Roberts, Engineer, herewith submitted.

The following statement shows the estimated amount of work done during the year 1839:

Locks No. 16 and 17, dam No. 6, basin between locks, channel below outlet lock, and pool of dam No. 6.	$4,975 00
Locks No. 11, 12, 13, 14 and 15, with the adjoining levels and dam No. 5,	5,000 00
Dam No. 4, and pool 7 miles in length, and locks No. 9 and 10,	13,250 00
Dam No. 3, lock No. 8, excavation of rock and gravel, in new channel and piers, and abutments of new towing path bridge, at Connoquenessing creek,	8,722 00
Dam No. 2, and lock No. 7,	1,693 00
General repairs from lock No. 17 to lock No. 6, in clearing out canal and protecting towing path,	2,672 00
Locks No. 5 and 6, adjoining levels, (lock No. 5 was entirely rebuilt,)	8,570 00
Lock No. 4 was entirely rebuilt,	6,760 00
Aqueduct No. 2, caulking,	30 00
Aqueduct No. 1, rebuilding and lengthening abutments and piers, and widening the trunk,	4,372 00
General repairs from lock No. 6 to head of Beaver Division, clearing out canal, and repairing and protecting towing path,	2,350 00
Cost of tools on the Division,	1,200 00
Incidental bills not included above,	1,000 00
Total cost of work done,	$60,594 00
Deduct amount appropriated to Beaver Division, for repairs for 1839,	33,000 00
Balance due by Commonwealth,	$27,594 00

The late Board of Canal Commisioners, in their annual report, stated "that it would require a large sum to make substantial and permanent repairs on the Beaver Division," and asked an appropriation of $40,572 for that purpose. In the report of the present Board, of the 11th March last, they were estimated at $47,880. A reference to the foregoing statement will show that both estimates were too low. Upon a close examination, the locks were found to be in much worse condition than was anticipated,—several had to be razed to their foundation, and rebuilt.

The following statement shows the estimated amount required for repairs the ensuing year:

Rebuilding protection crib outside of lock No. 17, repairing basin, and repairing wall outside of lock No. 16,	$1,700 00
Repairing towing path above dam No. 6,	300 00
Repairing locks Nos. 12, 13, 14 and 15,	150 00

Gravelling dam No. 5, and removing bars,	800 00
Repairing locks Nos. 9 and 10, and level adjoining,	265 00
Repairing crib above lock No. 9,	570 00
Building stop gates opposite dam No. 4,	1,464 00
Gravelling dam No. 4,	1.200 00
Raising and protecting towing path between dam No. 4 and dam No. 3,	3,500 0
To complete the new bridge and channel at Connoquenessing,	3.993 50
Repairing lock No. 8,	900 00
Repairing lock No. 7,	750 00
Repairing locks No. 1, 2, 3, 4, 5 and 6,	300 00
Bridges and waste-wiers,	300 00
Raising and repairing towing path along pool of Shenango dam,	2,400 00
Incidental work on the Division,	2,500 00
Towing path bridge at New Castle,	2,300 00
Total amount required for 1840,	$23,392 50
Balance due in 1839,	27,594 00
	$50,986 50

From the amount of trade which may be immediately expected on the Beaver Division, the Board believe the interest of the Commonwealth would be promoted by the construction of a weigh-lock on that line,—this will require about $8,000, which, if the Legislature concur with them, should be included in the appropriation for new work on old lines.

The day is not far distant when Pennsylvania will find it her interest to construct a canal or slack-water navigation from Pittsburg to Beaver, and thus furnish an uninterrupted communication from Cleveland and the harbor of Erie on the lake, to our western metropolis, and thence to Philadelphia, thereby securing the carriage of the trade of Ohio and the lakes, to our own State works. The cost of transhipment at Beaver and Pittsburg, and the low stage of water in the Ohio river during the summer months, between those points, will be burthensome, and a source of continued vexation to transporters.

SUSQUEHANNA DIVISION.

This division extends from the junction, at Duncan's Island, to Northumberland, and is thirty-nine miles in length. Navigation opened on the 21st of March, and continued without serious interruption throughout the season.

In June last, a contract was made for erecting a new aqueduct over Penns' Creek. It is located below the old site, and will be thirty-five feet wide. This increased width will remedy the inconvenience

heretofore experienced in passing boats, and will greatly facilitate the flow of water to supply the lower levels. Owing to the scarcity of funds, which embarrassed our operations on all the lines, this work has not progressed with that rapidity which was desirable. As the delay did not interfere with the use of the Canal, it was not so material. It will be completed early the ensuing spring.

The inadequate supply of water on the upper level, induced the board to direct an additional feeder from the Shamokin pool, to be introduced below the guard lock. This work has been commenced.

But few repairs have been made to the Shamokin dam—the water in the pool was kept up during the dry season, by gravelling the dam and closing the shute. It never has been water-tight, and a sufficient sum should now be expended on it to avoid the annual expense of gravelling. The Engineer has included in his estimate of repairs, a sum sufficient to repair it permanently.

There are twelve locks on this Division, and eighty-six and five-tenths feet of lockage.

The following is the estimated amount required for repairs, viz :

Locks and water-ways,	$14,005 00
Shamokin dam,	30.600 00
Feeder from Shamokin pool,	2,100 00
Penns' Creek aqueduct,	18,426 00
Mahantongo aqueduct,	200 00
Berry's Run aqueduct,	120 00
Renewing and repairing bridges,	8,200 00
Repairing waste-wiers,	4,495 00
Ordinary repairs of banks, &c.,	3,000 00
Total amount required,	$81,146 00

The amount drawn from the Treasury for repairs during the last fiscal year is $4,000.

NORTH BRANCH DIVISION.

This division extends from Northumberland to Lackawana Creek, and is 72½ miles in length. Navigation opened on it the 1st day of April, and continued with as few interruptions during the season, as, from the wretched condition of the locks and aqueducts, could have been expected. The locks between Northumberland and Nanticoke were originally constructed of wood, and having been ten years in use, from the natural decay of timber, it will be apparent to all that navigation could only be kept up by the closest attention.

On the 27th of August last, proposals were received for rebuilding all the wooden locks on the North Branch Division, the aqueducts over Mill creek and Lodges' run, all the defective bridges on the division, and for constructing a substantial towing path along the pool of the Nanticoke dam. Contracts were entered into at prices favorable

to the Commonwealth, but the scarcity of funds prevented the rapid prosecution of the work. The locks will be built upon the combined plan, with wood and stone.

The feeder dam at Lackawana was swept away by the floods of last spring, and the shute of the Nanticoke dam very seriously injured. The latter has been placed under contract, and the repairs will be completed in time for the spring navigation.

By the fourth section of the act of the 19th day of July last, entitled "An Act to provide for the repairs of the several lines of canal and railroad, and to continue the improvements of the State," the Canal Commissioners were authorized to change the location of the feeder dam on the Lackawana river, and if necessary to extend the feeder up said creek to a distance not exceeding two miles, if in the opinion of the Commissioners, after a careful examination by a competent scientific engineer, they shall deem such change necessary to promote the interests of the Commonwealth, and ensure the permanency of said work.

The Board, accompanied by their engineer, Mr. Warford, personally examined the proposed change of location of the feeder dam, and are of the opinion, that for the purpose of introducing the Lackawana as a feeder, it will not be necessary to extend the canal two miles up that stream. A good location occurs about one-third of a mile above the old dam, which for all the uses of a feeder should be adopted; but if the Legislature designed to furnish to the inhabitants of Lackawana valley, (who are at present cut off from the improvements by the rapids in that stream,) an outlet for their rich minerals and agricultural products, by extending the canal beyond the "falls," which occur within the first two miles; then the dam should be constructed about one mile and seven-eighths above the former location. At that point there is an excellent site, requiring a little over two hundred feet weir on rock bottom, and between natural rock abutments, of coarse sand stone. Fifty-eight feet of lockage would be required to descend from the pool formed by this dam, to the level of the present canal; and the dam and locks are estimated to cost $96,000 00. No appropriation having been made by the Legislature, for the accomplishment of the proposed change, the Board directed the temporary dam, which had been hastily thrown up to supply navigation, to be kept in repair throughout the season, and postponed a decision until further Legislative action could be had on the subject. If the lower location be adopted, the dam and additional feeder are estimated to cost $11,700 00.

In addition to the repairs now under contract on this division, requiring a very large sum to be appropriated, the Board would recommend that provision be made for constructing a towing path bridge across the pool of the Nanticoke dam; for deepening about five miles of the lower end of the first level below the dam; for about one mile of protection wall below Berwick, originally constructed of timber; and for erecting a guard lock at Hemlock creek, to protect the canal below in times of flood.

The following is the estimated amount required for repairs, viz:

Renewing eight locks,	$66,386 85
Aqueduct over Lodge's run,	7,976 75
Aqueduct at Mill creek,	11,500 00
Repairing Nanticoke dam, (balance,)	2,662 89
Rebuilding shute at Nanticoke dam,	4,376 20
Constructing towing path along the pool of Nanticoke dam,	32,809 24
Rebuilding and repairing sixty-nine bridges, (balance,)	31,885 16
Castings,	750 00
Rebuilding walls,	13,500 00
Repairing weigh lock at Northumberland,	2,000 00
Renewing waste-weirs,	1,500 00
Renewing water ways,	3,500 00
Deepening five miles of canal,	7,950 00
Guard lock at Hemlock creek,	7,900 00
Towing path bridge across Nanticoke pool,	35,000 00
Lackawana creek,	11,700 00
Ordinary repairs,	10,500 00
	$251,897 09
Deduct unexpended balance of appropriation,	57,661 47
Balance required,	$194,235 62

The amount drawn from the Treasury during the last fiscal year, for repairs on this division, is $18,091 42.

WEST BRANCH DIVISION.

This division extends from Northumberland to Farrandsville, and is 73 miles in length. It also includes the Bald Eagle and Lewisburg side cuts, making an aggregate of 77¼ miles of finished Canal and slack water navigation. The lockage from the pool of the dam at Northumberland to Farrandsville, is 138½ feet. Although one of the main designs of the projectors of this improvement was to form a continuous water communication between the Susquehanna and Allegheny rivers, the expenditure so far as the work has progressed, has been a wise and judicious one, if even the completion of the work should for a time be delayed. This Board have the fullest confidence in the practicability of uniting the eastern and western waters by the West Branch route, and believe that that great object will be accomplished at no distant day. The line as far as completed, passes through one of the finest agricultural regions in Pennsylvania, and penetrates the rich beds of bituminous coal and iron ore of Lycoming and Centre counties. Navigation on this division has not been interrupted a single day during the present season, and the trade upon the Canal greatly exceeds that of any former year.

Twenty-five miles of the Williamsport and Elmira railroad have

been completed, and are now in active use, which has very considerably increased the business and travel on this division. If that road were finished to Elmira, in New York, it would open an important thoroughfare between the bituminous coal and iron region of Pennsylvania, and the Lake country, abounding with salt, gypsum, &c., of New York. Companies have been incorporated in both States, and the stock has been subscribed, but the deranged state of the currency, and consequent scarcity of funds, have for the present suspended the further prosecution of the work. Bituminous coal is used entirely as a fuel in the locomotives on this road.

In August last, contracts were entered into for repairing the dam across the Bald Eagle, and the dam at Dunnstown; the former is nearly completed, and the latter is in such a state of forwardness as to render it secure.

Extensive repairs are required at the Muncy dam—much of the covering of the dam has been worn through, and the stone filling washed out of the lower slope. It has been partially repaired this season, but will next year require thorough and permanent repairs.

The dam across Loyalsock creek requires planking; and the works connected with it being so low as to be liable to inundation in times of high water, the length of weir should be increased, or the embankments raised. The board would recommend the latter.

The walls of the combined outlet locks on the Lewisburg side cut have given way, and the whole work requires rebuilding. The dam also is in a bad condition,—it should be repaired, and raised an additional foot in height.

The following estimate shows the amount required for repairs on this division:

Dunnstown dam,	$28,594 75
Bald Eagle dam,	1,789 24
Bridges on Bald Eagle side cut,	1,241 00
Pine creek aqueduct,	2.589 60
Muncy dam,	28,250 00
Loyalsock dam,	3,925 00
Raising embankment,	2.6 5 00
Lewisburg dam,	7.662 50
Rebuilding outlet locks on Lewisburg side cut,	20.703 50
Water ways around locks,	3,150 00
Repairing lock walls,	750 00
Renewing wood work of one lock,	800 00
Repairs to lock gates,	500 00
Repairing bridges,	7,815 00
Repairing ice breakers at Northumberland bridge,	320 00
Ordinary repairs to Canal banks, &c.,	16,500 00
Whole amount required.	$127.215 59
Deduct unexpended balance of appropriation,	34.250 00
Balance required,	$92,965 59

Five thousand dollars will be required on this division for new work on old lines.

The amount drawn from the Treasury for repairs during the last fiscal year, was $27,924 07.

A towing path and road bridge is much needed across the pool of the Dunnsburg dam. In addition to the business upon the Canal which it would accommodate, the leading public road along the valley of the West Branch crosses the river at that point, the travel upon which would of itself, in the opinion of the Board, fully justify the expenditure which will be required in its construction. Its cost is estimated at $25,000.

On the 30th of October, the Board examined the Bald Eagle and Spring Creek Navigation. By the act of the 7th of April, 1835, the faith of the State was pledged for the payment of an interest of five per cent. per annum, for twenty-five years, on $200,000, the capital stock of the company; and by a subsequent act, the State became a stockholder to the amount of $25,000. The whole length of this improvement is twenty-five miles, extending from the State dam, on the Bald Eagle Creek, at the head of the side cut, to Bellefonte. The Board found nineteen miles of the lower end of the line, from the State dam to Eagle Iron Works, opened for navigation, in good order, and in active operation. On the upper section of six miles considerable work has been done; about one-third of the excavation and embankment is made; two locks are completed, and another nearly finished. The Board were informed that about $25,000 had been expended on the division of six miles, between Bellefonte and Eagle Iron Works. The capital of the company consists of $200,000 in stock, and a subscription, on the part of the State, of $25,000. The company realized $2,000, by the sale of a water right, and is now indebted abont $3,000. The whole expenditure of the company is, therefore, $230,000.

It will be observed from the foregoing, that, although this improvement is in the hands, and under the control of an incorporated company, it is in fact a State work, constructed on the faith and credit of the Commonwealth. By the third section of the act of 1835, it is reserved for the Commonwealth, at any time after the guaranty shall cease, to take possession of the work, and connect it with their other works of inland navigation, "on payment of the real cost thereof." On communicating with the President of the company, he has by letter informed the Board that the company would, at any time, surrender the charter to the State, the stockholders receiving a five per cent. stock on the actual expenditure. The location is good, and the work well and economically executed. The tolls the present year, in the unfinished state of the work, amounted to $2,155. By a table furnished by the Collector, it appears that the tolls received by the Commonwealth, on merchandize that ascended and descended the Bald Eagle and Spring Creek Navigation, amounted to $6,043. If the line were finished, the business would be greatly increased, and, as the tolls are pledged to the State to meet the guaranty, it is the

opinion of the Board that the Legislature should provide for its in mediate completion; and, by making such arrangement with tl stockholders, as would be satisfactory and just, connect this wor with the other public improvements of the State.

FRENCH CREEK DIVISION.

FEEDER LINE.

The French creek feeder, from the head of navigation, in the poo of Bemus' dam, three miles above Meadville, to the junction of th Erie extension, including the Conneaut lake, is twenty-seven miles length.

A portion of this line was completed in 1829, the remainder in 183 It was made with the design of conveying the waters of Frenc creek to the Conneaut lake, which it is proposed to raise to the heigh of eleven feet above its present surface, and thus form a great res voir for the Erie extension, or main line of canal from Beaver to t harbor of Erie. It is twenty-eight feet wide on the bottom, with descent of three inches to the mile, and is calculated for four f depth of water. Owing to the limited business done on this line canal, and the inadequate appropriations for keeping it in repair, it has not at any time been in a navigable condition throughout its whole length. Since July, 1837, when the dam at Bemus' mill was injured by the flood, no part of the feeder has been used for the purposes of navigation.

From the advanced state of the work on the Erie extension, the summit level of which can only be supplied from this source, a thorough repair of this line can no longer be procrastinated. It is expected, if the necessary funds are provided for carrying on the work, that the water will be let into the extension in 1841: the Conneaut reservoir should therefore be in readiness.

By the fourth section of the act of the 19th of July last, entitled "an act to provide for the repairs of the several lines of canal and railroad, and to continue the improvements of the State," the Canal Commissioners were authorized to change the location of the feeder dam on French creek, and extend the feeder up said creek, to a distance not exceeding two miles; if, after a careful examination by a competent engineer, they should deem such change necessary to promote the interests of the Commonwealth, and insure the permanency of the work. Upon examining the proposed change of the site of the feeder dam, the Board observed that it had been originally located at the point where it is now proposed to fix it, and that a part of the work had actually been done. The Legislature, not satisfied with the location made by the officers, who were familiar with the subject, and abundantly qualified to judge, directed, by a special act of Assembly, the dam to be built on its present site at Bemus' mill.

The Board have no hesitation in expressing their opinion that the first (or upper) location was the proper one, and if the work wa *snow*

be commenced, would recommend its adoption; but considering ie present situation of the work, they do not deem a change conduive to the interests of the Commonwealth, or necessary to ensure he permanency of the dam. They are satisfied the works may be ade permanent at the present site. The cost of extending the feeder two miles further up the creek, to M'Guffin's falls, and building a ew dam, is estimated at $33,075 00. To repair the old dam at Bemus' mill, will require $16,412 00; accomplishing the same bject at less than half the cost.

The ruinous condition of the work on this line, requires that a liberal appropriation be made for repairs. The aqueduct across French reek is in such a condition, as to require a renewal of the trunk, and extensive repairs on the abutments and piers. The trunk being but fifteen feet in width, will be rebuilt conformably to the resolution of the Board of the 25th of March last, requiring all uncovered aqueducts to be thirty-five feet wide in the clear.

The following is the estimated amount required to repair the feeder line of the French creek division:

Feeder dam at Bemus' mill,	$16,412 00
Aqueduct over French creek,	19,607 50
Aqueduct over Watson's run,	3,140 50
Waste-weirs,	8,400 00
Bridges,	18,750 00
Canal,	22,500 00
Raising towing path,	6,750 00
Outlet lock and guard gates,	11,000 00
Total amount required,	$106,560 00

The amount drawn from the Treasury for repairs on the feeder line during the last fiscal year, was $4,000.

FRANKLIN LINE.

This line commences at the feeder aqueduct over French Creek, and extends down that stream to its junction with the Allegheny river at the town of Franklin, and is 22¼ miles in length. The lockage is 128½ feet. The surface of the water in the Canal at the aqueduct, will be level with the Conneaut Reservoir when full, and 510 feet above the level of Lake Erie.

This division of the public works has been so long neglected by the Legislature, that a very large sum will be required to effect the repairs which must soon be made, or the improvement abandoned.

The inhabitants of the valley of French Creek, are now, by the destruction of Bemus' dam, dam No. 1, at Sugar Creek, and dam No. 4, in a much worse condition than they were before the Canal was commenced; and sheer justice to them demands that the work should either be repaired, or the obstructions removed from the bed of the stream, and a free and uninterrupted descending navigation re-

stored. The completion of the Canal from Conneaut Lake to Erie, will, in the opinion of the board, justify the expenditure of a sum sufficient to place this line in a condition fit for public use. Especially, when it is considered that steamboats ply, to a considerable extent, a large portion of the year, between Pittsburg and Franklin.

When a continuous Canal from the harbor of Erie to Franklin is opened, it is not presuming too much, to anticipate a brisk reciprocal trade between the salt, plaster, and other products of the Lake country, and the iron, lumber, and the other staples, of the valley of French Creek and the Allegheny.

In August last, the Canal Commissioners directed the removal of dam No. 1, at Sugar Creek, which, from the lowness of the flats, caused great injury to the owners of lands above. To restore the navigation, it will now be necessary to construct a new piece of canal, nearly four miles in length, remove and rebuild one lock, build an aqueduct over Sugar Creek, three culverts, two waste-wiers, seven farm bridges, and three road bridges: which is estimated to cost $54,513 00.

Should the Legislature determine to make the necessary repairs on this line, the following sums will be required:

New Canal at Sugar Creek dam,	$54,513 00
Completing 1¼ miles of canal above dam No. 4,	12,381 36
Locks,	27,500 00
Bridges,	4,050 00
Dams,	27,300 00
Repairing and raising towing path,	6,000 00
Total cost of repairs of the Franklin line,	$131,774 36
" " " Feeder "	106,560 00
Whole amount required for French Creek Division,	$238,334 36

From which deduct balance of appropriation of $15,000, authorized by last Legislature.

The amount drawn from the Treasury for repairs on the Franklin line is $4,000.

ERIE EXTENSION.

The Erie extension commences at the head of the pool, six miles above Newcastle, and terminates in the harbor of Presque Isle, Erie. It is one hundred and five and a-half miles in length, and is divided into two lines, viz: The Shenango line, extending to the summit at Conneaut lake sixty miles, and the Conneaut line from thence to Erie forty-five and a-half miles. The ascent from the pool above Newcastle, to the summit when the reservoir is full, is two hundred and eighty-seven and a-half feet, and the descent from the summit to the surface of Lake Erie, is five hundred and ten feet: making the entire lockage seven hundred and ninety-seven and a-half feet.

SHENANGO LINE.

Forty-five and a half miles of this line were put under contract in 336, the remainder in 1838. During the past season, the work has rogressed with much spirit, notwithstanding the difficulty under /hich contractors labored for want of funds. The first forty-three iiles, extending from the head of slack water on the Beaver division, o the village of Greenville, will be completed and ready for the water bout the usual period of opening the navigation in the spring.

There are on this line forty-four locks; of these thirty-five are uilt of cut stone, and nine are constructed on the composite plan, vith stone walls, faced with plank, five dams, three aqueducts, wenty-one road bridges, forty-six farm bridges, eleven towing path ridges, and twenty-four waste-wiers.

The line crosses the Pymaturing Swamp, near its south-eastern ctremity, by a heavy embankment, which is to be raised to such eight, as to create a reservoir eleven feet deep, overflowing about ix hundred acres. This reservoir will be about fifty feet below the ain reservoir at Conneaut Lake, and will contain upwards of 145 illions of cubic feet of water above water line of the canal.

Conneaut Lake is designed to be converted into a great reservoir y embanking across the outlet at Evansburg, and introducing the waters of French Creek by an artificial feeder, which has already been constructed. The entire Conneaut line, and fifteen miles of he Shenango line, will rely mainly upon this source for a supply. The water in the lake, at its present elevation, is four feet below the ottom of the canal; when raised, it will be 11 feet above its present surface, covering twenty-six hundred acres. The upper three feet will be available as a supply during the dryest portion of the year, and contain three hundred millions of cubic feet of water above the usual depth of canal.

The whole cost of the Shenango line is estimated at $1,658,-679 06.

CONNEAUT LINE.

This line was located in 1838, and eleven and half miles, including twenty-three sections, thirteen locks, six culverts, and two bridges were let to contractors. The remainder of the work was put under contract during the present year. It is divided into sixty-one sections, comprising seventy-one locks, two aqueducts, five culverts, fifty waste-wiers, forty-one road bridges, and forty farm bridges. The locks will be built upon the composite plan of stone and wood, and the wooden locks directed by the late Board entirely dispensed with.

It was designed by the Engineer who lately had charge of this Extension, to pass Elk and Walnut creeks by means of high embankments and culverts. Upon examination of the line, by the present Engineer, he recommended the abandonment of the culverts

and embankments, and the substitution of aqueducts. The Board adopted his suggestions, and thereby saved to the Commonwealth upwards of one hundred thousand dollars in the cost of the construction. Those streams, at the points where the Canal crosses them, have worn immense gulfs. The banks on both sides are precipitous, composed of argilaceous slate, and about one hundred feet in height. The width across the Walnut creek gulf is six hundred feet, and across that of Elk creek, four hundred feet.

The work upon the Erie Extension is progressing as rapidly as the limited means under the control of the Canal Commissioners will admit. Should prompt provision be made by the Legislature for supplying the necessary funds, the whole line can be completed during the year 1841.

The entire cost of constructing the Conneaut line, is estimated at	$1,612,515 45
Shenango line,	1,658,679 06
Total estimated cost of Erie Extension,	3,271,194 51
Deduct former appropriations,	1,566,666 66
Balance required to complete,	1,704,527 85

The Board would recommend that one half the above sum required to complete, should be appropriated by the present Legislature.

For further particulars, in relation to the progress of the work, the location and condition of the line. and the supply of water, the attention of the Legislature is respectfully referred to the report of W. Milnor Roberts, Engineer, herewith submitted.

NORTH BRANCH EXTENSION.

The North Branch extension commences at the village of Athens, in Bradford county, and connects with the Wyoming line at the mouth of Lackawana creek. It is ninety miles in length, and has one hundred and eighty-nine and a-half feet of lockage.

The design of the Legislature in authorizing the extension of the North branch division to the State line, was to effect a connection between the improvements of New York and Pennsylvania. This connection is of immense importance to the interests of both States. It will not only add materially to the business done on the public improvements of both, but to the permanent wealth of large sections of the territory of each. It opens a new market for the rich anthracite and bituminous coal regions, embracing the valleys of the Wyoming, Lackawana and Towanda; and in return furnishes an improved highway to market for the salt, gypsum and agricultural productions of that portion of the State of New York, bordering on the lakes. During the past summer, the Board visited and examined the country

around the northern termination of this line of improvement, as well as the contemplated connections with it in New York. That State has already extended her improvements so as to intersect the Susquehanna, by canals at two points, viz: By Shenango canal from Utica, on the Erie canal, to Binghampton, on the Susquehanna, thirty-nine miles from the State line near Athens; and also from Montezuma on the Erie canal, by Seneca lake and the Chemung canal, to Elmira on the Chemung branch of the Susquehanna, sixteen miles above the State line, near Athens. A connection has also been formed from Montezuma by the Cayuga lake and the Ithica and Owego railroad, to Owego on the Susquehanna, eighteen miles from the State line. By surveys, made under the direction of the Canal Commissioners of New York, it has been ascertained that a connection by either of these routes is entirely practicable; and from the deep interest which that State has in accomplishing that object, this Board can entertain no doubt that it will before long be undertaken and completed. It is submitted to the Legislature, whether sound policy requires the adoption of any measures on the part of Pennsylvania to secure concert of action between that State and this.

That portion of the North Branch extension, between Athens and Wyalusing creek, is designated, the Tioga line; from Wyalusing to Lackawana it is termed the Tunkhannock line.

The Tioga line is thirty-five miles and fifty-six chains in length, and was put under contract in 1836. It is divided into fifty-eight sections, seventeen of which are completed, and the remainder in as great a state of forwardness as the funds applicable to the work would justify. The lockage is seventy-four feet, which is overcome by nine lift locks, in addition to which, there are four guard locks on the line, three aqueducts, two dams, nine waste-wiers and forty public and farm bridges.

The amount of the work done on this line, up to the 31st of October, 1839, is	$840,270 37
Amount remaining to be done,	548,610 73
Add 5 per cent. on amount remaining to be done,	27,430 53
Whole cost of Tioga line,	$1,416 311 63

By the 3d section of the act of the 19th July, 1839, the Canal Commissioners were directed to cause a remeasurement and re-estimate to be made by Messrs. Wm. B. Foster, Jr. and James D. Harris, as principal engineers, with such assistants as they might mutually agree upon, of all the work done on the North Branch extension, where the contractors were dissatisfied, and desired such remeasurement to be made. But two contractors on the North Branch, evinced their dissatisfaction with the estimates of Mr. Foster, and availed themselves of the provisions of this law—Mr. Amos Addis, contractor for section No. 10, and Sample, Edminston & Sample, contractors for section No 12. Upon their written application, the Board directed a remeasurement and re-estimate to be made by Mr. Foster and Mr. Harris,

in compliance with the act of Assembly, by whose joint report it appears that Mr. Foster's estimate was substantially correct. In one case they made a difference in favor of the contractor of $3 17, and the other of $17 70 cents.

The Tunkhannock line is fifty-four miles and nineteen chains in length. The most difficult and expensive sections of the line were put under contract in July, 1838. No part of the mechanical work has yet been commenced. The 2d section of the act of July last, making appropriations to this work, having prohibited the Board from putting under contract any portion of the line, not then contracted for, such sections as were declared abandoned by the Board in their resolution of the 21st day of May last, and reported to the House of Representatives, have been relet at an aggregate saving of more than one hundred thousand dollars to the Commonwealth.

The lockage is one hundred and fifteen and a-half feet, which is overcome by fourteen locks. In addition to which, two guard locks will be required. There are on the line, one dam, six aqueducts, twenty-six culverts, sixty road and farm bridges, and fourteen waste-weirs.

The limited amount of funds in the hands of the Canal Commissioners, during the present year, has greatly retarded operations on this line. Large sums were due before the loan was taken, and the monthly instalments since, have been entirely too small to meet the wants of contractors.

The work done on the Tunkhannock line, amounts to	$ 353,432 22
Amount remaining to be done,	1,758,558 35
Total estimated cost of Tunkhannock line,	$2,111,990 57
Cost of Tioga line,	1,416,311 63
Total cost of the North Branch extension,	$3,528,302 20
Deduct former appropriations,	1,346 666 66
Balance required to complete North Branch extension,	$2,181,635 54

The Board would respectfully urge the propriety of appropriating one half the above sum, required for the operations of the ensuing year.

The attention of the Legislature is referred for a detailed statement of the progress and condition of the work on the North Branch extension, to the report of W. B. Foster, Jr., engineer, herewith submitted.

WISCONISCO CANAL.

This canal extends from Wisconisco Creek, at the western termination of the Lykens' Valley Railroad, to the pool of the Clarke's Ferry dam at Duncan's Island, and is twelve and one-fourth miles in length.

All experience has shown that canals leading into coal regions are most profitable. This improvement is designed to furnsh an outlet for the coal of Lykens' and Bear Valleys, already in great demand, and in general use, and will, in the opinion of the Board, be a judicious investment of the Commonwealth's funds.

The work was placed under contract in August, 1838; and if means are provided, may be completed in the fall of the ensuing year. It consists of twenty-five sections, one dam, (across Wisconisco) one guard-lock, six lift-locks, three aqueducts, two culverts, five waste-weirs, and eighteen bridges. The lockage is thirty-five feet.

The water of Wisconisco Creek being insufficient to feed the canal in dry seasons, the Board would recommend that the Legislature authorize a feeder to be taken out of the Susquehanna at Walters' mill, two and a-half miles above Millersburg, where there is abundant fall in the river for that purpose,

The cost of work done, is estimated at	$127,216 49
Cost of work to be done,	248,978 94
Whole cost of Wisconisco Canal,	$376,195 43
Deduct former appropriations,	210,000 00
Amount required to complete,	$166,195 43

For minute details of the condition and progress of the work, the Legislature is referred to the accompanying report of A. B. Warford, Engineer of the Line:

WEST BRANCH—SINNEMAHONING EXTENSION.

No provision having been made by the last Legislature for carrying on this work, all operations on the line were suspended in July last. It is thirty-three miles in length, extending from the mouth of Tangascootac Creek, to the mouth of Sinnemahoning. If completed, it would carry the West Branch improvements into the centre of the bituminous coal regions, and add another link to the chain of communication, which will eventually unite the waters of the Susquehanna and the Allegheny. The practicability of the undertaking, upon the plan of constructing reservoirs, recommended by Mr. Aycrigg, the Board think has been fully established by that gentleman, in his report on that subject, sustained, as his positions are, by the

concurrent judgment of the most able civil engineers in the United States.

The line, as placed under contract in 1838, is divided into fifty-one sections, and will require two dams, two guard-locks, seventeen lift-locks, five aqueducts, nineteen culverts, ten waste-weirs, and thirty road and farm bridges. The lockage is 150 feet.

The whole cost of the line is estimated at	$1,388,099 15
Amount appropriated,	130,000 00
Balance required to complete,	$1,258,099 15

Should the Legislature determine to make no further appropriation, at this time, for carrying on the work, the sum of thirty-four thousand one hundred and twenty-four dollars will be required, in addition to former appropriations, to pay debts now due for work done, and materials delivered.

The third section of the act of the 19th July last, directs the Canal Commissioners to cause a remeasurement and re-estimate to be made by William E. Morris and Benjamin Aycrigg, with such assistance as they may mutually agree upon, of all the work done on the Sinnemahoning Extension of the West Branch Division, where the contractors were dissatisfied, and desire such remeasurement. Five contractors were dissatisfied with the estimates of Mr. Morris, and appealed from his decision. The Board, by their resolution of the 30th of October, directed a remeasurement and re-estimate to be made, as required by law. Mr. Aycrigg, one of the engineers named in the law, for reasons stated in a communication to the Board, declined acting in the matter; and as he was not in the service of the Commonwealth, they had no means of compelling his compliance with the requisitions of the act of Assembly. It is no more than justice that the contractors who feel themselves aggrieved, should have a remedy provided; and, as the refusal of Mr. Aycrigg to act, has rendered the law relating to their respective cases nugatory, the Board would recommend such action on the subject, as the Legislature may deem necessary to protect the rights of the parties interested.

TANGASCOOTAC EXTENSION.

This line commences at the feeder dam at Dunnsburg, and extends to the mouth of Tangascootac Creek, a distance of seven and a-half miles. The only work remaining to be done on the line, is the weir, and one abutment of dam No. 1, at Farrandsville. Operations were suspended on this job, and the accounts closed with contractors, in accordance with a resolution of the late Board of Canal Commissioners. The dam, however, is greatly needed to enable the owners of coal mines, on the Tangascootac, to get their coal to market.

The Board would recommend an appropriation of $24,000 for that purpose.

The dam at Queens' Run is now undergoing extensive and permanent repairs. It is located on gravel, and the water falling over the dam, had excavated the bed of the stream to the depth of fourteen feet, and undermined the dam about ten feet. It will be properly secured before the ice-freshet of the ensuing spring. Amount required to complete repairs, about $8,000.

ALLEGHENY FEEDER.

This improvement was authorized by the act of the 14th of April, 1838, and was placed under contract in August of the same year. It is about fourteen miles in length, commencing at Kittanning, and terminating at the aqueduct across the Allegheny river, near the mouth of the Kiskiminetas, and was designed to increase the supply of water in the Western Division, from the latter point, to Pittsburg.

No appropriation having been made by the last Legislature to prosecute the work, it was suspended, and final estimates returned and paid, including retained per centage, until the funds were exhausted.

The whole cost of the work is estimated at	$662,603 00
Deduct appropriation,	30,000 00
Amount required to complete,	$632,603 00

If the Legislature should deem it inexpedient to make any further provision at present, for completing this line, the sum of nine hundred dollars and fourteen cents, will be required to discharge debts now due.

GETTYSBURG RAILWAY.

By a resolution of the Legislature, approved the 19th of February last, the work on the Gettysburg Railroad was suspended from and after the 1st day of March then next, and the sum of $150,000 was appropriated to pay contractors for work done previous to that day, including retained per centage. The Board, in compliance with the act, directed the suspension of the work, and took immediate measures to ascertain the amount due contractors. By the report of the Engineer it will be seen that the whole amount of work done, is,

Upon graduation,	$543,839 91
Masonry,	76,113 05
Fencing,	2,866 65
Whole amount of work done,	$622,819 61

The whole amount due by the Commonwealth, it is believed, is embraced in the following statement:

For graduating,	$124,785 34
Masonry,	17,936 57
Fence,	1,010 75
Former engineers,	529 50
Engineers employed in remeasurement,	481 00
Superintendent,	300 00
Office rent,	168 00
Stationary, fuel, &c.	96 62½
	$145.307 78½

The temporary loan authorized by the act referred to, having not yet been negotiated, the above claims remain unpaid; if the funds were available, the sum appropriated would be sufficient to discharge all liabilities.

Such portions of the work as required protection, at the time of its suspension, have been secured, and the necessary measures taken to fulfil the requirements of the act. The Board, however, regard the amount expended on this road, as literally thrown away. It should never have been commenced; and being now suspended, should never be resumed. The practicability of the undertaking is, at best, doubtful; and, if completed, would, by being a source of continued expense, be worse than worthless to the Commonwealth.

SURVEYS.

By the 6th section of the act passed the 19th of July, 1839, the Board were directed, "to employ an experienced and competent engineer, and at least three assistant engineers, with their necessary corps, whose duty it should be to make thorough examinations and surveys with a view to form a connection between Harrisburg and Pittsburg, by means of a continuous railroad, and such routes as they should believe most practicable for such continuous railroad, between those points."

In accordance with this provision of the act, the Board appointed Charles L. Schlatter, principal engineer, who, upon receiving his appointment, proceeded to the organization of three separate parties, under the direction of competent assistants, to each of which was assigned a distinct field for examination.

To one party, were allotted all those routes north of the Juniata river, classed in the report of the Engineer, under the head of the "Northern route." To the second, the routes by the valleys of the Juniata, Conemaugh and Black Lick, under the general head of the "Middle route," and to the third, the examination of the route from Pittsburg to Chambersburg, on the "Southern route."

The surveys on the several routes, were commenced about the first of September, and were prosecuted with vigor, until the parties

were obliged, by the inclemency of the season, to close their field operations early in the month of November.

By referring to the preliminary report of the Engineer, herewith submitted, it will be seen, that during this short period, the surveys were so far extended on the Northern route, as to ascertain the practicability of passing the Allegheny mountain without inclined planes, and with grades, not exceeding forty-five feet per mile, and that on the middle route, the valley of the Little Juniata can be attained. from the summit of the mountain on the eastern side, by the same grade. On the Southern route, a favorable report has been made upon the line examined from Pittsburg to Laughlinstown, whilst the lateness of the season prevented the extension of sufficient examinations, to enable the Engineer to give an opinion of the proper route by which Laurel Hill should be crossed by the railroad.

The Board would ask the attention of the Legislature, to the importance of vigorously prosecuting these surveys during the ensuing season. A number of routes have been proposed, possessing such claims for consideration, that it would, in the opinion of the Board, be an act of injustice, not only to the interest of the whole State, but to those particular districts through which the proposed routes will pass, if they are not thoroughly examined, and careful comparisons instituted between the rival lines.

The appropriations of last year, will not be sufficient to defray the expenses of these extensive surveys; the importance of which the Board would desire to impress upon the Legislature, not alone on account of the primary object for which they have been commenced, viz: the location of a continuous railroad from Harrisburg to Pittsburg; but also from the amount of accurate geographical information which will be obtained in the course of the examinations, and which cannot fail to be of the greatest importance to the State, at no very distant period.

In addition to the power now granted by the Legislature to the Engineer, the Board would recommend that he be authorized to make the necessary surveys and explorations for a turnpike or M'Adamized road, with an easy grade, across the mountains, between Laughlinstown and Chambersburg.

By a resolution of the Legislature, approved the 13th of March last, the Board were required to cause a survey of the Lackawanna river and valley, from the feeder dam of the Wyoming division of the Pennsylvania canal, to the Ragged islands, to be made by a competent engineer, for the purpose of determining the best mode of improving the same, so as to bring the mineral and other products of said valley, to market through the Pennsylvania canals. The Board, in pursuance of said resolution, appointed Wm. B. Foster, jr., Engineer, to make the necessary survey and exploration, from whom a very full and satisfactory report has been received, which is herewith transmitted for the information of the Legislature.

When the public works of Pennsylvania shall be connected with those of New York, the anthracite coal of Lackawana valley, equal

in quality with any other in the Commonwealth, and in quantity inexhaustable, will be the most convenient to a Northern market.

The importance, therefore, of the proposed improvement, will be apparent at a glance; and if nothing further be done to accomplish it, by the present Legislature, the Board would recommend a sufficient appropriation, to extend the present feeder to the head of the Lackawana falls, the point most eligible for a feeder dam, having in view the improvement of the Lackawana, as well as the furnishing of a supply of water for the Wyoming division.

RESERVOIRS.

By the 10th section of the act of the 18th day of February, 1836, the Canal Commissioners were authorised to commence the construction of Reservoirs at the east and west side of the Allegheny mountain, to supply the Juniata and Western Divisions with water. Under the act referred to, the work was never commenced.

The act of the 19th July last, appropriates $70,000 to that object, and authorises its application as the Canal Commissioners shall deem most conducive to the public interest. On the 15th day of July last, the Board placed this work under the charge of William E. Morris, Principal Engineer. The necessary surveys have been completed, the locations made and approved by the Board, and the work placed under contract.

The site selected for the eastern Reservoir, is upon the south fork of the Juniata, on the land of Judge M'Ewen, within a mile and a half of the basin at Hollidaysburg, and is, in the opinion of the Board, the most eligible that can be obtained. A dam at this point, twenty-eight feet in height, and twelve hundred and thirty feet in length on top, will form a reservoir overflowing four hundred and fifty acres of land, and contain three hundred and twenty millions of cubic feet of water. This will afford an abundant supply for the Juniata Division during the dryest seasons.

The estimated cost of this work is $100,000.

The western Reservoir is located on the south branch of the Little Conemaugh river, ten miles from Johnstown, and two from the Portage railroad, at the point recommended by Sylvester Welch, Esq. in 1835. The Board think this selection the best that can be made.

A dam that will raise the water sixty-two feet, will be 850 feet long on top, will form a pool which will contain 480 millions of cubic feet of water, and cover four hundred acres of ground. Allowing the surface to be reduced two feet by evaporation, the reservoir will yield, without any supply for three months, 3,500 cubic feet of water per minute—being 500 cubic feet per minute more than the greatest amount that will be required. This work is estimated to cost $188,000.

Cost of eastern Reservoir,	$100,000 00
Cost of western Reservoir,	188,000 00
Total cost,	$288,000 00
Deduct former appropriations,	100,000 00
Amount required to complete,	$188,000 00

The eastern Reservoir may be finished during the ensuing season. The completion of the western will require another year.

The Board concur with their predecessors in recommending the speedy completion of theReservoirs. Navigation upon the main line should not be subject to interruption—and the present feeders are entirely inadequate to supply the upper levels during dry seasons.

For a detailed description of the work, the Board refer the attention of the Legislature to the report of the Engineer.

OLD DEBTS AND DAMAGES.

The appropriation to pay old debts has not been expended, owing to the limited amount of the loan which has been available. It has been received in monthly instalments, barely enabling the Board to pay a portion of the estimates on the extensions, and keep the lines in navigable order. The sum appropriated will be insufficient to meet the demands upon it; and although from a want of accurate information on the subject, the Board cannot fix the precise amount required, they are satisfied it will not fall short of fifty thousand dollars. Arrangements will be made for paying old debts as soon as funds can be obtained.

The payment of damages on the several lines of canal and railroads, has also been postponed for the same reason, and will receive the attention of the Board at the first possible moment.

TOLLS.

Amount of Tolls collected at the several offices on the Canals and Railroads of the Commonwealth of Pennsylvania, from November 1, 1838, *to October* 31, 1839.

CANAL TOLLS.

Easton,	$70,290 60
New Hope,	4,931 39
Bristol,	19,473 41
Columbia,	90,358 36
Portsmouth,	44,407 28
Harrisburg,	30,902 08
Newport,	4,681 06
Lewistown,	12,139 77

Huntingdon,	6,181 88
Hollidaysburg,	59,850 17
Johnstown,	95,705 25
Blairsville,	1,185 46
Freeport,	2,898 11
Alleghenytown,	41,132 76
Beaver,	2,087 33
Franklin,	1,059 65
Liverpool,	6,776 71
Northumberland,	20,981 74
Williamsport,	6,204 47
Dunnstown,	7,337 23
Wilkesbarre,	2,876 62
Berwick,	5,070 33
Columbia outlet locks,	616 36
Portsmouth outlet locks,	440 66
Swatara bridge,	653 53
Bridge at Duncan's Island,	2,619 40
Aqueduct at Duncan's Island	62 56
Aqueduct at Kiskiminetas,	418 07
Aqueduct at Pittsburg,	1,564 39
Total Canal Tolls,	$542,886 63

RAILROAD AND MOTIVE POWER TOLLS.

	RAILROAD.	MOTIVE POWER.
Philadelphia,	$131,970 30	$80,754 28
Paoli,	5,256 52	1,108 39
Parkesburg,	4,759 80	4,950 73
Downingtown,	5,231 05	4,488 19
Lancaster,	29,310 90	26,486 65
Columbia,	66,253 69	69,565 81
Hollidaysburg,	54,747 88	57,351 17
Summit,	2,099 39	3,241 66
Johnstown,	19,078 71	32,176 65
Schuylkill Viaduct,	914 64	
Total,	$319,622 88	$280,123 53

RECAPITULATION.

Canal tolls,	$542,886 63
Railroad tolls,	319,622 88
Motive Power tolls,	280,123 53
Total am't of Canal, Railroad and Motive Power tolls,	$1,142,633 04

From the foregoing statement, it will be observed that the tolls collected during the past fiscal year amounts to $1,142,633 04, being an increase beyond the tolls of the preceding year, of $151,380 62.

It cannot be expected from the discouraging prospects of business for the ensuing year, that the increase of tolls will be proportionably greater than it was during the present year, if, indeed, it be found so great. The Board estimate the probable receipts from tolls for the ensuing year, at $1,250,000.

Amount drawn from the Treasury for repairs during the year ending October 31, 1839.

DELAWARE DIVISION.

R. P. Lovett, former Sup'r.	$24,903 23		
J. B. Williams, "	4,531 05		
		$29,434 28	
D. Connor, present Sup'r.	33,459 20		
J. B. Calvin, "	14,719 23		
D. Y. Harman, "	13,000 00		
		61,178 43	
Total,			$90,612 71

COLUMBIA RAILROAD.

Wm. Russell, former Sup't.		24,871 12	
T. Tustin, present Sup'r.	15,750 00		
J. Collins, "	14,250 00		
J. Mosher, "	14,513 23		
		44,513 23	
Total,			69,384 35

EASTERN DIVISION.

A. Orme, former Sup'r.	7,069 98		
J. Foreman, "	2,690 18		
		9,760 16	
J. B. Lyon, present Sup'r.	12,600 00		
J. C. M'Allister, "	10,000 00		
		22,600 00	
Total,			32,360 16

JUNIATA DIVISION.

G. W. Patton, former Sup'r.		2,263 27	
T. O'Bryan, present Sup'r.	6,000 00		

Jas. Langton, "	8,000 00		
David Woods, "	8,750 00		
Wm. Price, "	12,500 00		
Jos. Riter, "	12,123 04		
		47,373 04	
Total,			49,636 31

PORTAGE RAILROAD.

A. M'Connell, former Sup'r.		8,194 51	
W. G. Moorhead, present Sup'r.		26,237 74	
Total,			34,432 25

WESTERN DIVISION.

B. F. King, former Sup'r.	3,245 52		
Jas. Elliott, "	2,000 00		
		5,245 52	
D. Watson, present Sup'r.	10,750 00		
Jas. Horrell, "	9,400 00		
A. Morris, "	8,500 00		
		28,650 00	
Total,			33,895 52

BEAVER DIVISION.

S. Kerr, present Sup'r.	8,000 00

FRENCH CREEK DIVISION.

Jas. Adams, present Sup'r.		4,000 00	
H. Brawley, "		4,000 00	
Total,			8,000 00

WEST BRANCH DIVISION.

J. P. Hackenburg, pr. Sup'r.	1,600 00		
C. Burrows, "	1,574 07		
		3,174 07	
H. Reeder, present Sup'r.	7,000 00		
T. Maxwell, "	9,000 00		
G. Crane, "	8,750 00		
		24,750 00	
Total,			27,924 07

NORTH BRANCH DIVISION.

Jas. Taggart, former Sup'r.	1,770 07		
D. Thompson, "	982 82		
		2,752 89	
D. N. Kownover, pr't Sup'r.	6,838 53		
J. Shriner, "	8,500 00		
		15,338 53	
	Total,		18,091 42

SUSQUEHANNA DIVISION.

J. Snyder, present Sup'r.	4,000 00
Total amount drawn for repairs,	$376,336 79

Of which $85,695 82 was drawn by the late supervisors, and $290,640 97, by the present supervisors.

The following is a recapitulation of the amount required for repairs on the several lines of canal and railroad:

Delaware Division,	$111,025 79
Eastern Division,	95,952 21
Juniata Division,	103,000 00
Portage Railroad,	42,000 00
Western Division,	124,500 00
Beaver Division,	50,986 50
Susquehanna Division,	81,146 00
North Branch Division,	194,235 62
West Branch Division,	92,965 59
French Creek Division,	238,334 36
Columbia Railroad,	363,890 64
	$1,498,036 71
Deduct unexpended balance of appropriations to main lines for repairs,	175,112 26
	$1,322,924 45

The following statement shows the estimated amount required to finish the several lines of canal and railroad under contract:

Erie Extension,	$1,704,527 84
North Branch Extension,	2,181,835 53
Sinnemahoning Extension,	1,258,099 15
Wisconisco Canal,	166,195 43
Allegheny Feeder,	632,603 00
Road to avoid Columbia Plane,	91,144 97
Reservoirs on Allegheny Mountain,	188,000 00

EXPENDITURES.

The following is a statement of the Expenditures for all purpose of Internal Improvement, for the year ending October 31, 1839.

New work on old lines,	$ 43,627 38
Repairs,	376,336 79
Damages,	33,608 58
Arching Grant's Hill Tunnel,	174 17
Construction of new work,	1,251,817 69
Feeder dams,	4,445 96
Motive power,	271,349 89
Locomotive engines,	7,500 00
Retained per centage,	2,084 49
Ropes, tools, &c.	18,444 16
Claims referred to Canal Commissioners,	9,500 00
Doubling locks,	16,000 00
Repairing aqueducts,	14,000 00
Outlet locks at Duncan's Island,	9,419 67
Ravine at Maull's Bridge,	9,358 23
Reservoirs,	3,000 00
Allegheny Feeder,	9,909 31
Surveys of railroad from Harrisburg to Pittsburg,	7,500 00
Total,	$2,088,076 29

OF APPROPRIATIONS.

The Board recommend the following appropriations for the ensuing year, viz:

For the Erie Extension,	$1,000,000 00
For the North Branch Extension,	1,000,000 00
For the Wisconisco canal,	166,200 00
For the Reservoirs on the Allegheny mountain,	100,000 00
To pay debts due on the Sinnemahoning Extension,	34,124 00
To pay debts due on the Allegheny Feeder,	900 14
For the completion of the railway to avoid the inclined plane at Columbia,	91,145 00
For renewing north track of the Columbia railroad with T rails, or towards avoiding the inclined plane, if the Legislature should so determine,	247,000 00
For payment of balance due for doubling locks on the Eastern Division,	7,402 21
For building new weigh locks,	15,000 00
For repairs on Franklin line,	100,000 00
For repairs on all the finished lines of canal and railroad, except the French Creek Division,	700,000 00
For repairs on French Creek Feeder,	70,000 00

For new work on finished lines, pay of Canal Commissioners, appraisers, and engineers not connected with extensions,	50,000 00
For damages,	25,000 00
For purchasing new locomotive engines and ropes for the Columbia and Portage railroad,	75,000 00
To pay debts due for repairs. &c., contracted prior to the 1st of February, 1839.	50,000 00
To complete the surveys for railroad between Harrisburg and Pittsburg,	20,000 00
Total,	$3,751,771 35

If the Legislature should determine to complete the work under contract on the Sinnemahoning Extension of the West Branch Division, and the Allegheny Feeder on the Western Division, the following sums will be required during the ensuing year:

For the Sinnemahoning Extension,	$300,000 00
For the Allegheny Feeder,	300,000 00
	$600,000 00

Should the suggestions made by the Board meet the approbation of the Legislature, it would secure the completion of the improvements now in progress, and constituting a greater portion of the public works originally contemplated, within the period of two years.—This is an object of so much importance to the people of Pennsylvania, that the Board trust with a good degree of confidence, that their views will be approved by the Legislature. When it is once effected, we shall have reached a point that has long been looked to with the deepest interest. A point where the utility and productiveness of our public improvements will be fairly put to the test, and the wisdom and sound policy of undertaking them be clearly settled. Notwithstanding the derangements in the currency, and general business of the country, the Board do not hesitate to express the opinion, that the canals and railroads of this Commonwealth will prove themselves a valuable investment of the public money, and the main pillar on which must rest the future greatness and prosperity of Pennsylvania.

JAMES CLARKE,
EDW. B. HUBLEY,
WM. F. PACKER,
Canal Commissioners.

TONNAGE REPOR

A statement of the several kinds of property shipped westward upon the Pennsylvania Improvements, at the several offices on the Main L

ARTICLES.		PHILADELPHIA.	PAOLI.	DOWNINGTOWN.	PARKESBURG.	LANCASTER.	COLUMBIA.	PORTSMOUTH.	HARRISBURG.	NEWPORT.	LE
Flour,	Barrels,	431				168	400	27	101		
Wheat,	Bushels,	7				420		99			
Corn and other grain,	"	582½			61,860	33,599	3,045	41,198	4,721	2,780	
Clover and other grass seeds,	"	10,768				21½					
Potatoes,	"	8,382½				702		2,017	178	4,125	
Salted Beef,	Barrels,							32			
Do. Pork,	"							108	7,050		
Bacon,	Pounds,	226,906				4,263	8,500	261,725	27,998		
Fish,	Barrels,	6,541½				40	1,187	15,500	354		
Butter and Cheese,	Pounds,	28,405				1,061		2,225			
Lard and Tallow,	"	945				460		1,810	600		
Salt,	Bushels,	38,473½				617		76,417	938		
Provisions not specified,	Pounds,	122,672				84,209		16,041			
Feathers,	"	13,868				1,202					
Wool,	"	95,732						320			
Cotton,	"	192,691				20,507					
Hemp,	"	355,404					9,869	391,049	31,762		
Tobacco,	"	68,485	250			11,988	242,993	54,105	20,883		
Leather,	"	501,869				9,014	16,167	1,760	19,662		
Raw Hides,	"	561,919				400	591,735	815,719	19,323		
Furs and Peltry,	"								972		
Whiskey and Domestic Spirits,	Gallons,	27,060				90,733	406,564	44,681	5,850		
Merchandize,	Pounds,	24 360,216				72,326	1,756,586	23.719,395	1,658,521		
Groceries,	"	19,780,484	2,500	668		85,886	388,365	6,794,646	336,392		
Oil,	Gallons,	69,332				225		49,776	1,103		
Drugs and Dye-stuffs,	Pounds,	8 063			59		1,349,716	225,270	8,367		
Gypsum,	Tons,	1.706½				2½		6,588	60		
Furniture,	Pounds,	1,087,734	16,600	13,665	12,869	120,117	227,062	300,745	163,217	48,320	
Window Glass,	Boxes,	152						21			
Rags,	Pounds,	466,730									
Mineral Coal,	Tons,	894½						1,899	71	839	
Iron Ore,	"						5,281	35	1,034		
Do. Pigs and Castings,	Pounds,	506.315	500	7,000	5,498	208,323	106,260	379,590	81,904	342,616	
Do. Bloom, Bar and Sheet,	"	2,922,534				165,526	275,306	1,168,984	330,848	117,996	
Lead in Pigs and Bars,	"	179.009						17,700	100		
Copper and Tin,	"	288.956				5,600		81,016	5,199		
Marble,	"	234,976				21,922	139,596	283,243	21,102		
Lime,	Bushels,					200		500	9,106	2,500	
Limestone,	Perches,				96				1,080		
Slate for roofing,	Pounds,										
Bricks,	Number,	212,166				2,725		17,335	10,948	19,550	
Timber,	Feet,					25,114				12,000	
Sawed Lumber,	"	86,125			1,150	16,915		110,950	30,976	47,200	
Staves, Heading and Hoop Poles,	Pounds,	94.490			700						
Shingles,	Number,	26,361						93,000	9,000	5,000	
Posts and Rail,	"	17,385			4,963	8,000		128	100	501	
Sundries,	Pounds,	2,307,275	7,450	139,756	8,963	193,872	143,987	1,900,691	760.853	34,244	
No. of Boats and Cars,	Cleared.	20,720	373	774	1,150	6,336	2,213	4,080	1,173	712	
Passengers,	Miles travelled,		203,507	6,477	8,910	256,945	320,111		2,254,554	7,283	

E REPORT, No. 1.

everal offices on the Main Line and the Susquehanna and North and West Branch Divisions, during the year ending the 31st October, 1839.

Harrisburg.	Newport.	Lewistown.	Huntingdon.	Hollidaysburg.	Summit.	Johnstown.	Blairsville.	Freeport.	Liverpool.	Northumb'land.	Berwick.	Williamsport
101				31			83	51		662	482½	37
								831		273	600	
4,721	2,780	56,020	3,007	377		450		486		3,981	187	2,505
				12½		51		168				
178	4,125	10,086	1,668	86			118	507		318	68	
											2½	3
7,050									53	36	17	5
27,698		4,474							16,143	96,711	14,858	9,690
354		1,463½	668	12,286		9,870	3		269¾	8,858	204	225½
		1,119		10,747		18,178		775				
600							1,000			600		
938		2,357	1,438	815		281		200,200	1,753¼	11,557	173	1,895
										947		
				139								
				35,366		30,761		8,980				
						17,806						
31,762				608,640		465,831				3,846		
20,883		4,148		332,345		336,712						
19,662		1,472	300	473,830		426,489	8,643	1,425		2,200	400	2,300
19,323		1,500		83,697		53,163	700		12,483	66,425	10,691	4,803
972				2,706								
5,850		4,589	4,763	165,329		136,113	472		1,251	97	5,787	5,620
1,638,521		1,070,462	1,021,602	28,022,154	4,419	25,647,151	103,665		556,471	1,824,677	229,310	309,394
336,392		183,380	169,333	14,615,459	4,556	8,335,654	16,187		386,924	1,993,752	330,336	117,983
1,103		1,715	942	92,061		74,910	1,004	240	176	1,045	280	90
8,367		1,773	26,102	539,817		542,051	400				248	
160		370	555	1,914		10,922			48½	1,490		389½
163,217	48,320	61,140	13,714	1,676,015	7,147	1,284,580	56,300	25,300	15,270	69,077		10,825
			43	251					12			
						2,213	2,181	3,700				
71	839	1,124½	80	316½					20	5,395		189
1,034										3,328	1,024	29
81,904	342,616	1,536,829	4,094,052	909,564		469,561	408,127		152,742	399,764	267,700	39,116
330,848	117,996	1,122,482	576,784	23,083,003	4,109,600	26,232,559		600	34,243	135,926	47,835	2,710
100		1,500		10,028		6,719				3,540		
5,199			200	302,848		230,346				3,140	9,537	
21,102			120	300,023		247,471	3,289		3,360	20,230	4,500	22,540
9,106	2,500						156				8,537	
1,080											148	
10,948	19,550	43,700			534		2,225			59,775	2,700	
	12,000		160							7,068		
30,976	47,200		45,700	10,914		1,300	68,203	5,500	17,975	5,700	6,140	44,000
				5,380			47,240					
9,000	5,000	40,000					19,000			55,000		8,600
100	501		400			42,900	11,000			1,000	1,371	
760,853	34,244	522,049	130,059	4,023,971		3,484,565	110,033	196,215	72,270	402,732	43,000	45,269
1,173	712	856	372	18,417	844	2,120		262	197	844	567	
2,254,554	7,233	4,472	59	666,802	769			2,875	1,662	106,139		270

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TONNAGE REPORT,

NO. 2.

A statement showing the several kinds of property arrived from the East and finally taken off the Pennsylvania Improvements, at the several specified offices on the Main Line, and the Susquehanna, and North and West Branch Divisions, during the year ending 31st October, 1839.

ARTICLES.		Paoli.	Downingtown.	Parkesburg.	Lancaster.	Columbia.	Portsmouth.	Harrisburg.	Newport.	Lewistown.	Huntingdon.	Hollidaysburg.	Summit.	Johnstown.	Blairsville.	Freeport.	Pittsburg.	Liverpool.	Northumberland.	Berwick.	Wilkesbarre.	Williamsport.	Dunnstown.
Flour,	Barrels	265	33	110			435	22					24			114		57½	4	58	638	49	41
Wheat,	do				6½												999				2880	1410	
Corn and other grain,	do			217	925½		194	1241	1500		7923	1150		3810	80		3377	366	8	16	6192	200	50
Clover and other grass seeds,	do			10	329½			851	219														
Potatoes,	do	2438	1106	329	8611½			298			3462	400					2099			17			
Salted beef,	do	4			6½																		
Salted pork,	do				22½			1070							6686				54		70		
Bacon,	Pounds	16726		14870	214325			108016	10594			15200			287			27662	127051	2275	23466	14638	37802
Fish, B.	Barrels	243	77½	67	1886		20	597	971		1897	519½	46	10949		62	11731	795¼	2100	78½	666	902½	724
Butter and cheese,	Pounds	385		259	18454						3619						45773						
Lard and tallow,	do		6495		2065			1583	975														
Salt,	Bushels	2596	4139	8217	22178			5929			6009	1871		322			206202	6170	7884	137	94	6972	3768
Provisions not specified.	Pounds				153480												28655	239	17342		6200		
Feathers,	do				530									139									
Wool,	do	18065		11030	2607									39606	319		8080						
Cotton,	do	17688	2188	47965	18153									12918			5689	5¼					
Hemp,	do	144848	4112		96262			40201	2225			1141		630963			625971		4952		1000		
Tobacco,	do	28106		2541	91781			5053			1406	4543		305429	456		378887	3120	2523				
Leather,	do	26141		841	355331							13922		560381	3182	7814	464186	450			1200		
Raw hides,	do	22296	5818	55832	418822		2752	72943	216743		7301	8598	2060	11921	3671		79589	59925	167414	7828		69894	1170
Furs and peltry,	do																						
Whiskey and domestic spirits,	Gallons	2418	1934		28327		11900	1622	976		4124	4073	3585	133232	2377	2364		545	792	1332	15350	1030	8565
Merchandise,	Pounds	58628	534253	39267	3127121			1277812	92454		174043	349080	28948	28587670	24894	150569	30821331	1404404	3556492	91340	219713	921321	1105941
Groceries,	do	947640	156637	739272	6972870			132640	25418		578315	590538	70249	11679680	156227	97140	10813116	560225	3032395	207850	596432	718923	338368
Oil,	Gallons	1952	1911	601	27389			768			635	5843	366	71362	1668	760	91147	290	726	2296	5456	171½	
Drugs and dye stuffs,	Pounds		10323	930	15575		1800	3737			25962	13089		431654	7088	342	592657			248			
Gypsum,	Tons	122	320	721	1053½			607	777		735	85		26			12	300½	1188	5		514½	412
Furniture,	Pounds	68804	16890	21717	414816			78294	55674		29016	36856	4690	1352195	7376	25691	1444759	25518	148751		4200	44749	2000
Window glass,	Boxes			52	1844							45			39				498		103		
Rags,	Pounds	28364	457793	37860	39921		8005														1167		
Mineral Coal,	Tons	822	508½	15½			219153	1386	77		177	21					707	61¾			38	1064½	95
Iron ore,	do						4300	2868	76									114		633½	747	748½	3126
Iron, pigs and castings,	Pounds	36950	160478	67301	235685			22558			2974352	18633		377621	41368	14193	872786	34997	161683	59000	81100	187718	56199
Iron, bloom, bar and sheet,	do	685204	159453	83134	1972782			238740	1814		20133	54899		25632239	36754	2114	32958817	134820	165447	137590	107538	286270	7239
Lead in pigs and bars,	do	6206		565	9985						13290	1662	600	6429			32937		3515				
Copper and tin,	do	13380		2100	725307							20430		226870			278869	553	2630	8918		732	
Marble,	do	13717		4988	157149			58504	11200		4590	820		173257	4770		700536	32661	49976	3000		61501	
Lime,	Boshels							500	250											2092	12222		
Limestone,	Perches							29										13		156	26		
Slate for roofing,	Pounds							11200										237½					
Bricks,	Number		34391	9320	76907			16333	4500		85500	4876					149400	24150	1524	3615		20000	
Timber,	Feet	5553															600				11200		
Sawed lumber,	do	73681		1500	16226		195026	36261	6300		73140						26198	7000	8475	3000	16869		20200
Staves, heading and hoop poles,	Pounds	42600		500	1735										4100		167625		950				
Shingles,	Number							91000	45000								8000	7000			6000		
Posts and rails,	do																9410						
Sundries,	Pounds	502641	283042	96046	375751		95208	233811	52571		149647	32343		2413263	10824	321398	10244224	105082	341443	40000	113377	337750	188281
Number of boats and cars,	Cleared	2166	1523		7045													82	143				219
Passengers,	Miles travelled	35959			10328		20				21			65560½				18840					

TONNAGE REPORT,

NO. 3.

A statement of the several kinds of property shipped Eastward upon the Pennsylvania Improvements, at the several offices on the Main Line, and the Susquehanna and North and West Branch Divisions, during the year ending the 31st October, 1839.

ARTICLES.		Pittsburg.	Freeport.	Blairsville.	Johnstown.	Summit.	Hollidaysburg.	Huntingdon.	Lewistown.	Newport.	Harrisburg.	Portsmouth.	Columbia.	Lancaster.	Parkesburg.	Downingtown.	Paoli.	Liverpool.	Northumberland.	Berwick.	Wilkesbarre.	Williamsport.	Dunnstowo.
Flour,	Barrels	55220	150	4445	55185	40	59184	7074	14751	12223	1360	371	15476	76636	13492	12250	1685	1812	12878	162		813	501
Wheat,	Bushels	1835	3101	5557	8475		9455	30620	118413	43470	6386	12571	13572	2707	6690	7158	160	52475	156534			38 817	26,558
Corn and other grain,	do	18226	141	3295	31719	522	3767	405	5723	4767	5238	1491	609	21148	8709	7046	24008	12436	25218	619	12	1,200	383
Clover and other grass seeds,	do	1092		54	2370		1250	351	4335	2325	35			26771	28			6745½	7572			375	40
Potatoes,	do	29	60		387	42	438	40		075	135	80	600	11	926	72	16	1890	4578	1516	2110	805	
Salted beef,	Barrels			300	91		80							740								5	
do pork,	do	857			770		218							104¼			88		30		3		
Bacon,	Pounds	1140586	1132	4271	1130169	12865	1003103	29435	51703	6221	11676	14130	191586	912043		200			435				950
Fish,	Barrels	146		872	3¾		15	4	3	5	1			1	4	3	11	8			2		
Butter and cheese,	Pounds	27426		3625	29160		37498	47249	18683	47763	5232			3473	150906	28332	18449	3500	88080	81306			
Lard and tallow,	do	334045		240	379604		377487	14603		300		6530	17465	34228	1300	8495	100		600				
Salt,	Bushels	250	1000	11427	7913	325	5262	37				170			9				2959		12	1,438	
Provisions not specified,	Pounds							3800						2347012	59269	121343		8043	132507				
Feathers,	do	43408		1000	45247		53247	64						29646	800	1100							
Wool,	do	1010462	6070	6112	998707		1057093	66054	213		750		2796	97013	105		700		400		300		
Cotton,	do	300			3508								3400	21921	1100								
Hemp,	do	766017			793397			46800					1500	58817			96100						
Tobacco,	do	3011100			2201315		873889	4107			1950	4218	43200	85574		3600	1178		7100				
Leather,	do	45099		117	13910		19889	8673	22868	246124	78370	1280	66791	433455	27840	16041	34160	43169	62239	1560	2050	25,050	840
Raw hides,	do	31412	432		6080	900	146692		680					207263				500				2,029	
Furs and Peltry,	do	217749			209235		35325	409															
Whiskey and domestic spirits,	Gallons	34052		7510	37794		10544	477	19424	4234	1489		13158	446417	203617	119755	840	5773	66429	1092	330	5,432	1,500
Merchandize,	Pounds	325204	3000	1282	151115		194390	26763	15362	500	18370			40501			2450	2840	8923	1100		5,847	
Groceries,	do	525524		2065	86164		86711	11546	7676		21744			14978				2721	14498	1100	6340	3,458	6,335
Oil,	Gallons	2578	760		1508		836						400	322				304	264		60	75	
Drugs and dye stuffs,	Pounds	6753			5506		60466	515							700							6,835	
Gypsum,	Tons						17½					198							19	35	20		
Furniture	Pounds	248057		14020	219420	2745	178917	21850	46485	22160	53600	28790	77825	183185	36899	31661	28130	17811	104383	9800	26788	20,850	
Window glass,	Boxes	1675	11335	7	4532		13161	21						428	6								
Rags,	Pounds	109841			117736		119351	27730	30802	37678	40702		80615	90555	14170	2296		44586	122036	5121	1767	13,320	6,450
Mineral coal,	Tons	1816		53	1720	1207	25098	567	335		3055	6547		125½			3	81524	7508	10458½	5081	615	1,334
Iron ore,	do		353					1321	175	39					190¾				2027				410
Iron, pigs and castings,	Pounds	449127		4874	187203		232942	194051	803148	1745232	2820540	857065	831010	2735490	756174	111332	18240		2947316	132873	223280	438,458	1,802,560
Iron bloom, bar and sheet,	do	585237	900	3706	2065899		1173717	347010	778532	8960	1131871	45830	9. 6299	2009108	327427	2574366	10820		283186		1154	2,057,809	2,031,861
Lead in pigs and bars,	do	4988			9753		3193							728									
Copper and tin,	do				2065		1573							8080			100		1000	450	1800		
Marble,	do		500								500			1457		651893	1640198				150		
Lime,	Bushels				27					600	900				2025		450			3085			
Limestone,	Perches		100									10			335				40	500¾			
Slate for roofing,	Pounds																						
Bricks,	Number	34803			3602		141096	54000	6000	54000	108430	9825		4075	8800				21836	2250		42,000	69,393
Timber,	Feet		1600				1436			423100	6912		8042298	24800	11600		390		2499				2,900
Sawed lumber,	do	91466	119190	33795	61813	155306	249569	28800		24100	811905	236491		404613	6350		13000	457379	104103	34283	100608	85,755	17,654
Staves, heading and hoop poles,	Pounds						42866	2340	215452	174070	447741	30240	82260	42320			26600	100800	92450			91,627	
Shingles,	Number	62000	4000				33000	47000	5000		199980	30000	1549104	176100				124000	193000	20000	81300	8.000	37,500
Posts and rails,	do			2000	22506		2342		2728	430	2498		21600				500	2300	500				
Sundries,	Pounds	1360357	13811	28926	1370744	35084	2265317	28056	58804	111866	2883287	169800	267802	594387	311055	987065	638573	82931	951870	3000	14600	61,100	563,388
Number of boats and cars	Cleared,	2862	16		14713	809	3048	346	556	712	833			9879	1980	2037	2341	366	974	367	436	578	283
Passengers,	Miles travelled,	2771528	766		254928		197163	89	5039	746	1104321	20		39805	16995	13899	46859	4698	98029			188	

O. 4.

Susquehanna[illegible]t Oct. 1839.

Parkesburg.	Do	Williamsport.
		670½

TONNAGE REPORT, NO. 4.

A statement of the several kinds of property arrived from the West and finally taken off the Pennsylvania Improvements, at the several specified offices on the Main Line, and the Susquehanna, and North and West Branch Divisions, during the year ending 31st Oct. 1839.

ARTICLES.		Freeport.	Blairsville.	Johnstown.	Summit.	Hollidaysburg.	Huntingdon.	Lewistown.	Newport.	Harrisburg.	Portsmouth.	Columbia.	Lancaster.	Parkesburg.	Downingtown.	Pooli.	Philadelphia.	Liverpool.	Northumberland.	Berwick.	Williamsport.
Flour,	Barrels	584	60	64,803	809	1,558	131			638	51,701						109,940	31	900		670½
Wheat,	do			927		32	183			45	427,297						12,476	811	13,245		
Corn and other grain,	do	3,141	739	20,279		1,811	70			1,097	24,579						43,099	5,360	120	618	
Clover and other grass seeds,	do			879		60				36	18,789						4,826		60		
Potatoes,	do	30				520	129			150	1,372		180				1,324	685	1,764	388	
Salted beef,	do			150													17,079				
Salted pork,	do	108								518	111						8,284		4	4	
Bacon,	Pounds	40,873	5,407	10,686,324	19,711	350,091	90,051			129,745	886,381		7,213				5,766,609	2,446			
Fish,	Barrels	69	7	4		38	7				23		131				7	7	2	7	
Butter and cheese,	Pounds	189	579	16,125							337,134						86,136				
Lard and tallow,	do			382,428		470	300				14,894						250,002				
Salt,	Bushels		389	7,775	1,355	2,510	110			17	8						8	381	42	193	3,530
Provisions not specified,	Pounds									2,468	12,980		306				75,430			2,000	
Feathers,	do			27,384		559					1,682						33,817				
Wool,	do			1,012,315						4,810	29,372						1,114,483		600		
Cotton,	do			300									6,000				26,579	177½			
Hemp,	do			765,987	66,950						19,706		10,095				700,976				
Tobacco,	do	1,590	1,022	2,738,231	961	6,600				2,200	39,488		7,721				1,365,930				
Leather,	do	1,593	1,511		1,469	3,068				4,459	548,081		2,979				424,080		3,069		
Raw hides,	do	2,758	479	1,600							2,490						66,145				
Furs and peltry,	do			161,787																	
Whiskey and domestic spirits,	Gallons	6,660	1,945	17,224	4,972	611	1,045			1,220	241,263				2,850		284,762	2,446	6,621		
Merchandise,	Pounds	41,281	29,694	218,033		21,179	21,276			10,996	103,647		115,168		175		506,485	3,537	4,000	15,923	
Groceries,	do	143,838	53,537	134,283	4,023	93,345	35,125			2,429	51,000		76,985				5,755	5,400	6,340	25,436	
Oil,	Gallons	241	174	1,492		390					128						641		66		
Drugs and dye stuffs,	Pounds	67		262		40					15,515		6,881								
Gypsum,	Tons																	1½	20	30	
Furniture,	Pounds	44,008	14,050	181,544	400	9,531	19,368			66,659	94,690		24,640	3,624	400		267,925		29,505	3,000	1,800
Window glass,	Boxes	17	37	3,830	4	550	19			252			1,967				201½	48,398			
Rags,	Pounds			80,209						1,100	347,535				48,089		178,902		10,600	13,183	58
Mineral Coal,	Tons			1,865		1,042	1,208			4,157½	41,018		6,431	1,445	734	87	377½	1,189½	5,738	5,886½	
Iron ore,	do						1,321		1,095	7	4,000							2,102			154,220
Iron, pigs and castings,	Pounds	71,756	34,658	320,629	5,542	23,247	82,552		120	218,024	8,588,408		308,451	119,388			2,030,695	511,288	237,248	113,650	239,628
Iron, bloom, bar and sheet,	do	31,553	48,544	100,779	813	305	54,040			86,390	5,249,687		63,328	425,100	18,775		3,134,097	9,284	756,985		
Lead in pigs and bars,	do		376	1,248											9,262		833,507				
Copper and tin,	do		432		660					1,089	1,000		6,618				1,565		150		
Marble,	do	150		790	3,231						500		4,215				1,460,496				
Lime,	Bushels																				
Limestone,	Perches										117									887	
Slate for roofing,	Pounds																				
Bricks,	Number	13,000		11,300		2,500	54,000			6,378	82,159			4,800				6,378	63,842		
Timber,	Feet		2,400			12,137				1,500	10,439		6,000				52,500		1,168		
Sawed lumber,	do	7,900	300	8,000		37,000	32,012			48,565	1,378,532		4,034,485	583,450	2,486,500	329,866	835,370	279,000	25,981	1,300	
Staves, headog and hoop poles,	Pounds										1,080,364		195,875				56,412		21,627		
Shingles,	Number	30,000				13,000	20,200			2,000	447,480		537,700	201,100	203,500		155,890		129,600	17,000	50,000
Posts and rails,	do			988			75			2,950	2,808		28,054				10,000	1,100		1,301	
Sundries,	Pounds	233,438	90,114	1,546,684	18,414	40,416	10,882			170,298	2,568,126		93,300	53,470	13,421	8,730	4,154,900	73,661	138,890	677	2,888
Number of boats and cars,	Cleared										4,080		4,249		810	264		54	505		
Passengers,	Miles travelled						2			384	16		964					1,477			

TONNAGE REPORT, NO. 5.

A statement showing the several kinds of property shipped and taken off at the soveral specified offices on the Delaware and Beaver Divisions.

ARTICLES.		DELAWARE DIVISION.								BEAVER DIVISION.	
		Shipped Northward		Taken off South.		Shipped Southward.		Taken off North.		Shipped West.	Taken off west
		Bristol.	New Hope.	New Hope.	Easton.	Easton.	New Hope.	New Hope.	Bristol.	Bridgewater,	
Flour,	Barrels	721	11		31	73,458	10,534		78,179	2,248	1,918
Wheat,	Bushels	14,573		1,313		4,439			2,500	11,127	873
Corn and other grain,	do	23,604	500		870	61,728	2,854		83,808	63	462
Clover and other grass seeds,	do	308									750
Potatoes,	do	6,017	207	8	2,701	2,018	232		2,040	123	4,761
Salted beef,	Barrels	7			8						
do pork,	do	1,741	37		1,032	2	15		23		
Bacon,	Pounds	54,803	3,088		44,151		2,274		15,033	202,647	1,400
Fish,	Barrels	2,790	1	6½	2,611	30	4		43	79	2
Butter and cheese,	Pounds	4,970			950	6,835	125		1,171		124,717
Lard and tallow,	do	18,692	47		1,624	3,383	700		5,520		
Salt,	Bushels	44,823		16	41,763	50	22			2,421	27
Provisions not specified,	Pounds	46,211	600		5,740		250		26,771		2,847
Feathers,	do								1,400		
Wool,	do	31,744			32,531					2,780	21,972
Cotton,	do	92,526			90,653	4,554			4,554	13,070	
Hemp,	do	32,437			7,894	5,712	34,089		30,707		
Tobacco,	do	235,273			71,243	7,607			33,145		
Leather,	do	10,439		900	6,281	171,549			207,084		1,752
Raw hides,	do	289,279			305,806	4,212	37,155		4,214		
Furs and Peltry,	do									20	
Whiskey and domestic spirits,	Gallons	24,035		64	8,382	205,308	25,729		220,071	928	3,904
Merchandize,	Pounds	471,068	9,237	150	605,421	5,910			112,420	849,986	31,721
Groceries,	do	3,685,147	2,346	5,187	3,202,388	3,850	700		3,850	9,639	
Oil,	Gallons	18,115	64	64	15,739	9,984	914		15,003	32	480
Drugs and dye stuffs,	Pounds	464,883			71,850		300				
Gypsum,	Tons	3,802	45		2,276						
Furniture	Pounds	75,497	2,300	2,100	33,042	177,464	12,780		174,122	105,395	87,153
Window glass,	Boxes	207		3						915	
Rags,	Pounds	9,636				103,398	5,720		122,319	53,143	51,024
Mineral coal,	Tons	843		½	589	171,762	715	397	189,809	2	3
Iron ore,	do					389			885	3,640	196
Iron, pigs and castings,	Pounds	628,302	23,081		217,167	4,481,255	15,957		3,537,718	215,269	441,903
Iron bloom, bar and sheet,	do	9,479,705	2,374	4,900	5,980,366	40,738			684,338	713,838	28,825
Lead in pigs and bars,	do	10,429			5,100	1,505			1,505		
Copper and tin,	do	15,750			18,442						
Marble,	do	110,005	15,180		101,069	200			200	4,950	633
Lime,	Bushels	125,878			653	8,702	123,197		86,114		1,119
Limestone,	Perches					171	2,643		1,121	10	17
Slate for roofing,	Pounds					323,098			323,748		
Bricks,	Number	334,823			51,500				2,481	7,250	60,000
Timber,	Feet					702			579	2,942	22,408
Sawed lumber,	do	262,350			23,306	3,707,824	945,645	167,287	4,649,315	107,750	67,814
Staves, heading and hoop poles,	Pounds	108,079			91,387	105,077			104,577		270,625
Shingles,	Number	377,350				2,500			65,000	40,000	18 000
Posts and rails,	do						3,925				1,040
Sundries,	Pounds	5,686,555	189,020	1,200	2,867,320	2,831,741	44,813		4,305,859	151,173	247,837
Number of boats and cars	Cleared,	3,895	175		3,250	3,673	414		3,908	365	329
Passengers,	Miles travelled,	4,107	334				3,925		1,386	476	40,583

COLUMBIA AND PHILADELPHIA RAILWAY.

REPORT OF WM. K. HUFFNAGLE, ENGINEER.

This important link in the chain of improvements is eighty-two miles in length, extending from Broad and Vine Streets, Philadelphia, to the Canal basin at Columbia, where it intersects the Eastern Division.

The principal part of this work is laid with the Wigan rail, upon stone blocks, with ties. In its course, there are eight bridges, or viaducts, and two inclined planes. As the intention of the original projector of this Railway was to accommodate it to horse-power, the structures, as then erected, have been found to be insufficient to sustain the weight of locomotives; it having become necessary to introduce additional girders in all the bridges, with the exception of that over the Brandywine, at Coatesville, which remains, as constructed under the direction of E. F. Gay, Esq., a model of durability and strength.

The Schuylkill bridge, built upon Burr's plan of arch and truss, is one thousand and forty feet in length, and forty-one feet wide in the clear, supported by six piers and two abutments, built of coursed, hammer-dressed masonry. It is thirty feet above the surface of the water, and divided into seven spans. The car and roadway are each eighteen and a half feet in width, and the central foot way four feet.—This bridge was finished in 1834, and cost one hundred and thirty-four thousand dollars. The only requisite has been the introduction of additional girders, the original timbers having proven too light for the passage of engines. An apprehension of danger from fire, and the unnecessary wear and tear to which it was subjected, induced the undersigned to recommend the construction of sidings, east of the bridge, for the reception of cars intended to be transported upon the road. The arrangements are nearly completed, which will render further repairs to the bridge unnecessary, and insure its safety, in a great degree, by the exclusion of locomotives. The cars will in future be conveyed across the bridge by horse-power, to the foot of the plane.

The intersection of the Reading road with that of the Commonwealth, takes place immediately west of this bridge; and the immense amount of anticipated tonnage will make the safety of this structure of vast importance, and render the three eastern miles of the road very productive—to such a degree that it may be found expedient to lay additional tracks, for the accommodation of the passenger travel. A depot will become necessary for the protection of engines on this level, which I have estimated, inclusive of pivots, track, and coal house, at seven thousand five hundred dollars. A temporary shed is in progress, which will answer all purposes during the coming winter, and which can readily be converted into a wood and coal house, when more permanent arrangements will have been made.

A portion of the track, near Coates street, has been raised ten inches above the original level, which will effectually preserve it from

the difficulties heretofore experienced at that point, in being flooded during the winter. The length of road thus improved, is one thousand five hundred and fifty feet, and will materially facilitate the operations on that portion of the track. It has been re-laid upon mud sills, with locust cross ties, and the T rail—which is the best mode of construction, as affording ease to the machinery, being entirely devoid of that jar experienced on the block road, and having all the elasticity and strength so desirable in a perfect railway.

The Schuylkill plane next claims our attention. It is two thousand eight hundred and five feet in length, having an altitude of one hundred and eighty-seven feet, or one in fifteen. Its capacity is two thousand tons daily, and is worked by an engine of sixty horse power and an endless rope of seven inches circumference.

Safety cars have been adopted upon this plane, affording additional security to passengers and merchandise. The north track upon the plane is laid upon stone sills, which are difficult to retain in adjustment, and at present very much out of repair. I have estimated the re-laying of this portion at six thousand one hundred and sixteen dollars—proposing to sink the present longitudinal sill, and use it as a foundation for a superstructure of locust cross ties, placed at every three feet lineal of track, and laid with the T rail. A new rope will also be required, the cost of which is estimated at three thousand four hundred and twelve dollars. These improvements will be necessary, whatever course may be pursued with regard to avoiding the inclined plane, and their use will not depreciate the value of the material employed.

The road between the head of the plane and the intersection of the West Chester railway, eighteen miles, has but one permanent track—the other, being laid upon timber, with the bar rail, has become decayed and unfit for service, and during the past season has been subjected to slight repairs—merely rendering it safe for slow travel with horse cars. It has been deemed expedient not to expend much upon this track, as in all probability, the obviation of the Schuylkill plane would render a great portion thereof useless. The repairs upon the permanent track referred to, have been extensive during the past season, on account of its being in constant use, both for the ascending and descending trade.

At Morgan's Corner, fourteen miles west of the city, the course of the Railway has been changed, and by a thorough cut of one quarter mile, five curves have been discarded. This improved portion is graded, and ready for the rails. The bridge at Maul's has been filled with an embankment, as also that at Smith's, two miles farther west. These are important improvements, and serve gradually to abolish all perishable material from the line, which, in point of bridging and superstructure in general, will eventually be the most economical course—the cost of laying rails upon which, is estimated at six thousand seven hundred dollars.

A road bridge, at Street Road, crossing the cut just mentioned, has been erected during the past summer. The Valley creek bridge, is

the next structure of importance upon this road. This, situated about thirty-two miles west of Philadelphia, was destroyed by fire in March, 1838, and rebuilt during the same season upon the lattice plan. This bridge is five hundred and seventy-five feet in length, and divided into four spans, and cost, inclusive of false works, seventeen thousand two hundred and eighteen dollars. This structure proved inadequate, principally from the following causes: the hasty manner of its construction, the employment of unseasoned timber, and the insufficient depth of lattice. After having been subjected to the travel, it soon exhibited symptoms of failure; and when the undersigned took charge of the work, it had settled thirteen inches below the original level, having reached a depth of seven inches below a horizontal line. The principle of strength being destroyed, was rapidly tending toward total destruction. Measures were immediately adopted to secure it, and the repair instantly commenced. Three double arches, seven by fifteen inches, were introduced into each span, which were bolted to studding erected between the chords. This species of repair was preferred to intermediate bents, which would have effected the appearance of the structure. A substantial and neat railing has also been erected, which improves its appearance, and renders the crossing at all times safe. This bridge is sixty feet above the creek, and will need no further repair except calking, which is estimated at two hundred and fifty dollars.

The viaduct at Downingtown, over the East Brandywine, thirty three miles west of Philadelphia, has required many repairs during the past season. It is four hundred and twenty feet in length, and has four spans, of which there are two of eighty-eight feet six inches in lenght between the piers, and two of one hundred and twenty-one feet seven and a half inches. The latter are in the centre. Early in the season, the tremulous motion exhibited in this structure, called for temporary support, which was effected by bents and side braces. Laterly, a repair of a more substantial character has been made. Foundations of solid mortar masonry, twenty-eight feet in length, six feet in breadth, and eight feet in height, have been erected between the piers, in the centre of each of the western arches, upon which bents of white oak timber, capped and cross-braced, have been placed. These effectually secure the bridge from all danger, and render it perfectly safe. The span across the stream is proposed to be secured by the introduction of three additional arches, from the crown of which studding will be erected to support the girders and assist in bearing the additional weight of the T rail, with which the bridge will be laid during the coming season. I have estimated the repairs at three thousand eight hundred dollars.

The deck bridge at Coatesville, built upon Burr's plan, remains permanent and unimpaired, after five years constant use. It is eight hundred and thirty-five feet in length, and divided into six spans, and is seventy-two feet above the surface of the Brandywine. The piers are built of that quality of masonry denominated rock work, and of a close grained limestone. The only repair, this bridge will require,

will be in calking, which is expensive, and will cost three hundred and seventy-five dollars.

The thorough cut below Parkesburg, has always been a source of much expenditure to the commonwealth, on account of the character of the adjacent soil, which is a blue clay or marl, easily effected by rain; the removal of which from the roadway, has been a constant expense. The only remedy which can be adopted, will be the erection of a wall, to be built of the largest stone which can conveniently be procured, four and a half feet at base, and five feet high, with a batter of two feet on the face. This will require twenty-five hundred perches, which I have estimated at five thousand dollars.

At Parkesburg, forty-five miles from Philadelphia and thirty-seven from Columbia, the state repair shop is located. At this point of the repairs of the motive power are made by mechanics in the employ of the commonwealth, and under the direction of the master machinest. The machinery is driven by an engine of eight horse power. The arrangements of the shop are found perfectly suitable for the business, and will need little expenditure, except for gearing, which will require a general repair. The state buildings, both work shop and dwelling, will require additional security from fire, for which purpose I have included, in the estimate, an engine and hose at twelve hundred dollars.

This has become the most prominent water station between Columbia and Philadelphia. Three stations have already been erected at this point, at which, if the trade rapidly increase, another will be required. The necessity of a large reservoir or basin, has long been felt, and which could be constructed at an expense of two thousand five hundred dollars, and would form a permanent and valuable improvement. The erection of a station latterly, has rendered this at present unnecessary. I have therefore, not included the cost in the estimate, but merely suggest it for the consideration of the board.

The track through the Gap cut, originally laid with string pieces and the bar rail, upon caps and piles, having become decayed and unfit for use, has been relaid with the T rail, upon white oak string pieces, six by ten inches, laid flat wise, bolted to the caps and coated with coal tar. The new track is tied at every eight feet upon the curve and twelve feet upon the straight line, with iron bars placed at the surface of the timber. This effectually counteracts all leverage, from the conical form of the wheel, and occasional friction of the flange.—One track is completed upon this plan and in use, the other will be finished in ten days from this date.

The grade on this point of the railway is forty-five feet per mile, for three-fourths of a mile on each side of the summit. The improvement of this portion of the railway, will have a most important effect on the motive power, as the tonnage of all engines has heretofore been regulated by the number of cars they were capable of transporting over the old track; since the improvement of which, it has been ascertained from actual experiment, that the same expense of power will convey from ten to twelve tons of additional burthen. The whole length

of this thorough cut, is forty chains, through which the railway is founded upon piles, from ten to twenty feet in length, driven through the quick-sand, into the solid material beneath. This, the highest point on the line, is thirty miles from the canal basin at Columbia.

Arrangements were undertaken, during the last administration for procuring running water, at Lemon station, twelve miles from Lancaster, which remains unfinished. The completion of which will require an appropriation of twelve hundred and fifty dollars, and will form an important improvement, in despensing with the services of one waterman, and thereby saving the commonwealth the interest upon the whole expense.

The Pequea bridge, eleven and a half miles from Lancaster, built upon Burr's plan, is a single arch of one hundred and fifty-one feet span, eighteen feet four inches in width, and roofed, finished in 1830, and cost eight thousand seven hundred and thirty-five dollars and fifty cents. The track through this bridge, is laid with the bar rail upon wooden stringers. The structure being firm, and fully capable of bearing additional weight, is proposed to be relaid with the edge rail.

The bridge at Mill creek has been subjected to important improvements during the past year. It originally consisted of four spans, built upon Burr's plan, eighteen feet four inches in width, and five hundred and fifty feet in length; the highest pier being forty feet above the surface of the creek. This bridge was imperfectly constructed, the masonry built without bonding, being a confused mass of rough stone thrown together, regardless of rule or order. The foundation insecure, settled during the first year of use, and the piers owed their preservation to the support received from jackets of dry, but solid, masonry, enclosing each. The superstructure deficient in strength, has been temporarely propped, during the last five years, it having failed upon the passage of the first engine. Its insecurity and incapacity for repair, induced the undersigned to recommend to the board that the two eastern spans should be filled with an embankment, and the remainder be replaced with a deck lattice bridge, rendered both fire and water proof by a covering of the best leaded tin. The embankment is nearly finished, and all the timber has been delivered for the superstructure. The new bridge will be improved by a double track, and be ready for use during the month of January next. The embankment was let on the 7th of June, and abandoned; it was relet on August 27th, since which it has been rapidly progressing. It will contain when finished, about fifteen thousand cubic yards. The superstructure will be two hundred and seventy feet in length, and built upon Town's plan. The whole expense of this improvement was estimated at thirteen thousand dollars, the interest of which will be saved by dispensing with the watchmen now employed.

The bridge over the big Conestoga, near Lancaster, is the longest on the railway. It is built upon Town's plan of lattice, and is one thousand four hundred and twelve feet in length, eighteen and a half feet wide, and roofed; having ten piers and two abutments, of uncoursed rubble masonry, laid in lime mortar. The highest pier is sixty

feet above the Conestoga. It was built in 1830, and cost thirty-one thousand five hundred and three dollars and fifty-seven cents. The only repair of consequence which this bridge has received, has been the introduction of iron rods of one inch diameter, between the upper and lower chords. This has corrected the tremulous motion previously observed, and rendered it perfectly secure. The only ordinary repair during the next year, will be the adjustment of the track, and keying up the braces, estimated at nine hundred and fifty dollars.

The great extent of this structure, renders it an object of much solicitude to those more immediately concerned with its safety. The stream over which it is constructed, being only one hundred feet in width; consequently, at least thirteen hundred feet of perishable material is unnecessarily employed. The undersigned would respectfully suggest the propriety of an appropriation for the purpose of constructing a stone viaduct of three arches at this point, and filling the remainder with an embankment. The cost of which improvement would be about forty-thousand dollars; and the erection of which could be prosecuted without impeding the free use of the road.

In the city of Lancaster, the engines are supplied with water from the city works, at the rate of twenty cents per engine. This arrangement is economical, as well as expeditious, the tanks being filled in one and a quarter minutes by means of an upright arm connected with the main pipe. During the last year a bridge has been erected over the railway at the New Holland turnpike, in accordance with the resolution to that effect. The bridge at Hensell's alley, the letting of which has been advertised, and for which the commonwealth is to pay eight hundred dollars, is included in the estimate annexed. The Harrisburg and Lancaster railway intersects with the state improvements, at a point one and a quarter miles west of the city. The trade of the Cumberland valley and Harrisburg roads, has become of such importance, as to require on the part of the commonwealth some reciprocity for the advantages derived from those extensions, in constructing the necessary sidings, for the reception of the trade intended to pass over the Columbia road, at a convenient point for attachment to the state engines. A depot, for their protection, and a small shop for the temporary repair of the engines engaged in transporting the Harrisburg trade, will be necessary, in order to obviate the necessity of sending them to Columbia, a distance of twelve miles, after having discharged their respective burthen. A siding to accommodate one hundred cars will also be required.

These improvements, I have estimated, if laid with the rail already in the possession of the State, at six thousand four hundred and twenty-five dollars—which will be increased or diminished, according to the location adopted. Two points have been advocated, one at Dillerville, the other at the intersection of the Harrisburg turnpike with the Columbia and Philadelphia Railway. Should a siding be constructed during the next year, and laid with the edge rail, the cost will be increased to twelve thousand six hundred and sixty dollars.

The Little Conestoga bridge, two miles west of Lancaster, built

upon Burr's plan, is eight hundred and four feet long, and eighteen feet four inches wide—completed in November, 1830, and cost fifteen thousand three hundred and fifty-nine dollars. This structure has long exhibited its inefficacy. Immediately after opening the road, it became necessary to support one of its piers with heavy buttresses.—The others have been repaired at different periods, and during the next year, the repairs upon the superstructure will amount to seven hundred dollars, and to the masonry, twenty-two hundred and fifty dollars.

The north track, between the Schuylkill plane and the Westchester intersection, will require renewal. The amount of the subjoined estimate on which will be necessary, which ever route may be adopted for avoiding the inclined plane. Should the present track be re-laid, the estimated amount will be sufficient to renew the defective road; and if any other be determined upon, an additional sum will be required to complete the grading thereon. This is eighteen miles in length, and will cost, re-laid with the T rail (sixty pounds to the yard,) and locust cross ties, upon plank embedded in broken stone, with crossings, two hundred and forty-six thousand seven hundred and fifty-two dollars and sixty-four cents.

The old material in the present track, consisting of six hundred tons of bar rail, (estimated at fifty dollars per ton,) will be worth thirty thousand dollars.

ESTIMATE FOR ONE MILE, SINGLE TRACK.

105 tons T rail,	at $80 per ton,	$8,400 00
1,760 locust cross ties,	" 80 cents,	1,408 00
34,320 feet plank, (board measure,)	" $14 per thous.	480 48
3½ tons cast chairs,	" $80	280 00
8,000 brad head spikes,	" 5 cents,	400 00
1,100 screw bolts,	" 12 "	132 00
320 rods mechanical work,	" $5	1,600 00
640 perches broken stone,	" $1	640 00
Taking up old track,	" $1 per rod,	320 00
		$13,660 48

Should it be determined to retain the present location at the Schuylkill plane, an appropriation will be necessary for the purpose of securing a plentiful supply of water at that point, which can most readily be effected by a force pump attached to the gearing of the plane, and obtaining the requisite supply of water from the Schuylkill—which, inclusive of pipes and fixtures, I have estimated at five thousand dollars.

The number of burthen cars at present registered, amount to twelve hundred and ninety; being an increase of two hundred during the past year.

The improvements in car wheels, have generally been in modification of the plate wheel, which is found to be the most durable, and

the least liable to fracture: some of which consist in arching the wheel below the tread, and in the addition of curved half spokes to support the rim. Both appear to answer the purpose well, as no accidents from fracture have latterly taken place. The axles are three and a half inches diameter, made of piled iron, entering full size, and having the shoulders supported by the elongation of the hub, which adds much to their stability.

An improvement in the common Wigan chair has latterly been made, which promises to be a source of much economy in the general repair of the Railway. It consists in a movable jaw, which confines the rail in its proper position without the use of wedges, and is secured to the block in the usual manner.

There are thirty-four engines in service upon this Railway, of which twenty-three were made by M. W. Baldwin; three by H. R. Campbell; three by William Norris; two by Garret and Eastwick; two by Dotterer & Co. of Reading, and one by Winans, of Baltimore. Of these, fourteen are first class engines, weighing thirteen tons, cylinder twelve and a-half inches diameter; stroke sixteen inches, driving wheels fifty-four inches diameter, and capable of transporting from one hundred and twenty to one hundred and forty tons over the road, and are in actual service in the transportation of burthen. The balance are second class, or eleven ton engines, when filled for action —cylinders twelve inches diameter, and stroke sixteen inches, four of which are employed in the transportation of passengers, and two are engaged upon the Schuylkill level between the plane and Philadelphia.

The adoption of the first class, or thirteen ton engines for burthen, has proven the most economical for transportation, but undoubtedly the most injurious upon the rails, having a general weight of six tons upon their driving wheels; their effect at a high velocity upon a rail of forty pounds to the yard, is apparent in numerous instances, in the compression of its surface, and exfoliation of the several lamina of which it is composed, which are vertical and too readily separated by excessive pressure. On this account there will be required to replace those rails, which have proven defective, at least one hundred tons edge rail of the same pattern as that now in use, which is estimated at eight thousand dollars.

The grades being established by the completion of the railway, and consequently improvement in that quarter being impracticable, we naturally seek those points which will admit of it, which consists in the reduction of its curvature, and the introduction of the edge rail on all parts of the road. These remedies have been effectually commenced, and a serpentine portion of the railway, near Morgan's corner has been superceded by a straight line of nearly half a mile in length, which can be advantageously extended, and the road in numerous points so improved as to reduce the wear and tear of engines and cars, and subserve to their rapid transition over the road. For this purpose the sum of ten thousand dollars has been included in the estimate. The second remedy is in full tide of successful experiment. The improvements at the Gap previously referred to, is a striking

evidence of its importance—the thereby increased ability of the motive power, will soon amply remunerate the commonwealth for the expenditure, besides adding to the stability and facilities of the railway.

The bridges having been properly strengthened, will be improved by the removal of the flat-bar and string-pieces, and the edge rail be introduced. The traction being found by experiment to be as seven to eight, upon these respective modes of construction.

The repairs during the past year have been extensive and costly, on account of the condition in which this improvement was transferred into the hands of its present officers. The expenditures have been made in repairs to bridges, which were in some instances unsafe for travel—adjustment of track, which was in a dangerous condition—in ditching and draining the road, which department appeared to have been almost entirely neglected—in replacing broken castings, and in cross-tieing the track in numerous points. The necessity for expenditure during the next year upon this track will be small in comparison with that of the past season ; it having been, by the unwearied exertions of the efficient supervisors, put into such condition, as to be rendered almost perfect, as has been evinced by the ease and regularity, with which transitions are now made.

In conclusion, the undersigned takes much pleasure in congratulating the Board, upon the complete success of coal as a fuel for locomotives. The West Branch bituminous, has been successfully used in the engine originally constructed for wood, without any alteration in their fire boxes or other apparutus. The anthracite requires greater draught, and consequently blowers have been arranged to operate upon the fire, through an enclosed ash pan, the fan being driven by steam, taken from the dome of the engine. There is now no reason why the complete introdution of coal cannot be effected, and wood entirely discarded, except for purposes of ignition. For the particulars of the several experiments, the Board is respectfully referred to the report of the superintendent of motive power, under whose immediate direction they have been conducted.

ESTIMATE OF ORDINARY REPAIRS.

Repairs of Track on Schuylkill level,	3	miles, at	$500	$1,500	00
" " to steamboat station	24	"	350	8,400	00
" " to Gap,	28	"	300	8,400	00
" " to Columbia,	27	"	350	9,450	00
				$27,750	00

BRIDGES.

Schuylkill bridge—relaying with T rail,	$950 00
Coatesville " caulking,	375 00
Valley Creek " "	250 00
Downingtown " bents and arch introduced,	3,800 00
" Over railway at Gap, replanked, &c.	175 00

" Over Big Conestoga, bracing and repairs,		950 00
" Over Little " masonry and repairs of superstructure,		2,900 00
Sener's bridge, repairs of,		170 00
		$9,570 00

WATER STATIONS.

Deepening well at Morgan's corner,	$200 00
Repairs to stations at White Hall and steam boat,	275 00
" " Downingtown, Gallagherville and Parkesburg,	175 00
" " Lemon's and Kinzer's,	130 00
	$780 00

WOOD HOUSES.

Repairs of	$100 00	
		$100 00

CROSS TIES AND CASTINGS.

4,000 cross ties, at 80 cents,	3,200 00	
94 tons castings, chairs, bolts, &c., $80	7,500 00	
		10,700 00

IRON.

100 tons Wigan rail, at $80	8,000 00	
		8,000 00

RECAPITULATION.

ORDINARY REPAIRS.

Repairs to track,	$27,750 00	
do bridges,	9,570 00	
do water stations,	780 00	
do wood houses,	100 00	
Cross ties and castings,	10,700 00	
Iron,	8,000 00	
		$56,900 00

EXTRA ORDINARY REPAIRS, OR NEW WORK ON OLD LINES.

Depot and coal shed at Philadelphia for the engines on the Schuylkill level,	$7,500 00	
Relaying north track on plane,	6,116 00	
do do to West Chester intersection,	246,752 64	
Tract at Maul's bridge, on improved line,	4,800 00	
do Smith's do do do	1,900 00	
Wall in Parkesburg cut,	5,000 00	
Bridge at Hensell's alley, Lancaster,	800 00	

Depot at or near Lancaster, for locomotives engaged in the Harrisburg trade, and sidings,	12,660 00	
To finish Leman's water station,	1,250 00	
Force pump and pipes for supply of water at Schuylkill plane,	5,000 00	
Rope at plane,	3,412 00	
Force pump and hose for shop at Parkesburg,	1,200 00	
Collector's office, Parkesburg,	600 00	
Reduction of curves on old line,	10,000 00	
Contingencies and supervision,	10,000 00	
		$316,990 64
Ordinary,	$56,900 00	
Extra ordinary,	316,990 64	
Total amount,	$373,890 64	

Respectfully submitted,

W. K. HUFFNAGLE, *Engineer.*

ROAD TO AVOID THE COLUMBIA INCLINED PLANE.

This very popular improvement is at length nearly accomplished. The graduation was completed in July last, and a single track of rails transferred from the former location, will in a few days be finished. The length of this improved line is six and a half miles, measured from the southern end of the canal basin, and graded in the following manner:

Stations.		Distance in feet.	Grade per 100 ft	Grade per mile.	Amount of each grade.	Direction of grade.	Elevation above basin.
0	to 6½	650	500	26.4	3.250	Ascending	7.250
6½	9	250	374	20	948	Descending	6.302
9	10	100	000	00	000	Level	6.302
10	13½	350	221	11.66	773	Ascending	7.075
13½	36	2.250	663	35	14.917	do	21.992
36	56	2.000	713	37.65	14.260	do	36.252
56	195	13.900	663	35	92.157	do	128,409
195	2 3	800	746	39.39	5.968	do	134.377
203	259	5.600	663	35	37.128	do	171.505
259	270	1.100	493	26	5.423	do	176.928
270	278	800	410	21.65	3.280	do	180.208
278	296	1.800	581	30.67	10.458	Descending	169.750
296	331	3.500	272	14.36	9.520	Ascending	179.270
331	343	1.200	493	26	5.916	Descending	173.354

The number of excavations is thirteen, amounting in length to three and a fourth miles. The longest is two thousand five hundred feet in length, and twenty-six and four-tenths deep at its maximum.

There are thirteen embankments, the aggregate length of which is

three and a fourth miles. The longest is three thousand and forty-five feet in length, and the greatest height of which is nineteen feet.

The following table will show the various horizontal deflections of the line:

	Length in feet.	Radius in ft.	Direction.	Magnetic bearing.
Track along	Columbia	basin.		S 26¾° E
Curve	35	352	Right	
do	385	1.273	Left	
Tangent	500			S 39¾° E
Curve	914	2.292	Left	
Tangent	781			S 61¾° E
Curve	900	4.584	Right	
Tangent	2.262			S 52° E
Curve	1.281	1.910	Left	
Tangent	3.707			S 88¾° E
Curve	550	2.491	Left	
Tangent	250			N 77½° E
Curve	500	2.865	Right	
Tangent	2.860			N 87½° E
Curve	1.283	1.910	Left	
Tangent	2.357			N 50¼° E
Curve	1.000	2.865	Right	
Tangent	4.400			N 70° E
Curve	1.100	4.584	Right	
Tangent	2.300			N 83¾° E
Curve	1.474	5.730	Left	
Tangent	5.126			N 68½° E
Curve	500	3.673	Left	

From which it appears that the aggregate lengths of the tangents or straight lines is twenty-four thousand five hundred and fifty-three feet, and that of the curves ninety-nine hundred and twenty-two feet. At the time the work was put under the charge of the undersigned, the graduation had been completed on sections No. 4 and 5; since then work has been done upon sections No. 1 and 2, to the amount of five thousand dollars, and upon section No. 3, to the amount of two thousand and fifteen dollars. It was also found necessary to employ a force upon section No. 4, to remove material which had slid in from the sides of the excavations. There had been laid eight hundred and eighty rods of rails—two hundred and eighty-seven rods of which, having been put down upon recent embankments and frozen ground, it became necessary to relay.

The whole work was remeasured by order of the board. This was a laborious task, as every book, containing notes or memoranda, had been carefully removed.

Estimates had been returned on the 1st of February, which were in possession of the superintendent, and contractors. The only sections

which were finally estimated, were No. 4 and 5. The estimate upon section No. 5, was found to be substantially correct, but in that upon section No. 4, the estimate of the present engineer, differs materially from the former measurement.

The undersigned would beg leave to call the attention of the board, to the location of the road through the town of Columbia, which is exceedingly faulty, and ill adapted to the purposes of transportation. The objections to it are many. It occupies, almost to the exclusion of all other travel, the street where most of the business of the place is transacted. The grade of the road is such as to require an embankment in some instances four feet higher than the foot pavement. This causes the water falling upon the street, to collect in a narrow and insufficient gutter, where it stagnates, to the great inconvenience and annoyance of the inhabitants: no cross vents or culverts having been constructed to drain it, and the street being too flat to allow it to flow off longitudinally. But by far the greatest difficulty is, that not more than two tracks can be laid, without entirely shutting up the street, as a thoroughfare for ordinary travel. How it was ever supposed that the different trains could be arranged at their arrival, and for their departure, it is impossible to conceive. There are two modes of alteration which are submitted. No. 1, is an entirely new location, from Union-street to the collector's office, running through the alley, between Front and Second streets.

ESTIMATE. (ALLEY ROUTE.)

Removing 12 stables and other wooden buildings,	$1,000 00
Graduation (4000 cubic yards earth at 25 cents,)	1,000 00
Masonry,	300 00
Laying 450 rods track, at $7 60	3,150 00
Damages to P. Haldeman's frame store house,	2,000 00
" J. Strichler's 2 story brick dwelling,	2,300 00
" 25 lots averaged at $200	5,000 00
Amount,	$14,750 00

Were the cost of construction and directness of route, alone to be taken into consideration, this would be the best line that could possibly be traced. But it must be remembered, that the whole alley which is the basis of this location, is lined, (and must continue to be so, unless the convenience of the proprietors be materially sacrificed,) with stables and other outhouses, whose combustible materials and contents must render the liability to destructive conflagrations very great. No computation has been made of this species of damage. The board can judge of the danger, and of the extent to which the commonwealth is bound to compensate such losses.

No. 2, is an alteration, from where the line now strikes Front street, to three chains north of Walnut street, by which two sidings of a thousand feet, each, could be obtained, and the street restored to its original condition. It is difficult to arrive at the exact value of the damage that would occur to the property on the lower side of Front street,

by this route. The tract of ground between Front street and the old railway, which will be affected by this alteration, as nearly as can be ascertained, is worth, including buildings, about twenty thousand dollars. Of this sum the value of the buildings may be stated at six thousand dollars, leaving fourteen thousand dollars as the worth of the ground. Now, if the old track be slightly elevated, and the ground between the new and old roads, be graded to a plane surface, the remaining three-fourths will be proportionably valuable. Hence we derive the following estimate, the graduation, including the filling of the remaining three-fourths of the lots. This route will require the destruction of the buildings and will occupy one-fourth of the ground in depth, between the old and new tracks.

ESTIMATE. (FRONT STREET IMPROVED ROUTE.)

Graduation (20,000 cubic yards, embankment at 25 cents,	$5,000 00
Masonry,	500 00
Laying 330 rods track, at $7 00	2,310 00
Damages, including ground occupied, and buildings,	9,500 00
Amount,	$17,310 00

The above valuation does not include the damage to the public ground, as the improvement of the present condition of the street is considered an equivalent.

The depot at Columbia is located at the head of the basin and previous to its erection, only a sufficient space was excavated for the site of the building, and no regard paid to the accommodation of the necessary fuel to be deposited at that point. The surrounding material is solid rock, varying from six to twenty feet in heighth, through which a narrow track has been cut, forming the only point of access into the building. The trade on the canal prevented operations on the excavation during the past season. It has been advertised for letting and will be completed during the winter, so that the Columbia inclined plane, may effectually be avoided by the coming spring.

Arrangements will be made for a supply of water at this depot, which can be effected, either by an arrangement with the Water Company, or by a small stationary engine and pump, drawing water from the river. I have included the expense of this fixture in the annexed estimate. The sawing of the wood can be effected by the same engine, and the same economical system adopted, now in operation at the Schuylkill plane. By reference to the preceeding table of graduation, it will be seen, that at station two hundred and seventy, the grade has attained its highest elevation; from which it *descends* eleven feet in a distance of eighteen hundred feet, thereby losing the elevation, gained at such great expense and inconvenience, in the borough of Columbia. The bridges having been erected, and a large portion of the grading done, previous to the appointment of the undersigned, any change in the graduation became impracticable, without resort to heavy expenditure. The superstructure of this road is laid in the most substantial and durable manner. In the excavations,

trenches being dug, blocks are laid therein, at distances of three feet from centre to centre, upon which locust cross ties are placed, and adjusted to their proper position. The depth of the base of the block is eighteen inches below the surface of the road, which will effectually secure it from the action of the frost. The embankments have been laid with mud sills, four by twelve inches, upon a bed of broken stone, well rammed, upon which the locust cross ties are placed, at every three feet lineal of road. The road back of the depot is in progress of graduation. This has been included in the estimate, on account of its completion being necessary, in order to afford the requisite facilities along the basin track,

On which has been estimated by the former Engineer,	$1,881 15
Required to complete,	5,300 00
Total amount,	$7,181 15
The final estimate for graduation amounts to	$154,291 60
Of which has been paid,	121,660 55
Balance due,	$32,631 05
Final estimate on depot,	$19,072 34
Paid,	15,450 05
Balaace due,	$3,622 29
The amount of work done on laying track,	$19,072 34
Paid by former Superintendent,	4,151 30
Balance due,	$12,731 14
Materials for first track unpaid,	$12 094 27
Amount due on fencing,	$979 14

ESTIMATE OF AMOUNT REQUIRED TO COMPLETE ROAD AVOIDING PLANE.

8,800 cross ties,	at 70 cents,	$6,160 00
150,000 feet, b. m. mud sills,	" $13 per thous.	1,950 00
6 miles track transferred,	" $2,400,	14,400 00
Excavation of ditches, &c. on track, est.		2,500 00
Engine and fixtures for pumping water and sawing wood at depot,		2,900 00
Castings, turnouts, and chairs,		3,200 00
Grading at basin for reception of fuel, 8,000 cub. yds. rock,	" 60 cents,	4,800 00
Track into depot,		1,800 00
Removing weigh scales,		250 00
To complete second track, and necessary fixtures,		$37,960 00

RECAPITULATION.

Balance due on grading,		$32,631
" " " depot,		3,622
" " " first track,		12,731
" " " fencing,		979
" " " materials used,		12,004
Amount required to complete second track and fixtures,		37,960
" " " " road back of depot,		7,181
		$107,109
Contingencies and supervision,	10 per cent.	10.710
		$117,819
To alter route through Columbia,		17,310
		$135,129
From which deduct unexpended appropriation,		43,984
Total amount required to complete all arrangements,		$91,144

Respectfully submitted,

W. K. HUFFNAGLE,
Engineer

[No. 2.]

Report of James Cameron, Superintendent Motiv Power.

To the Honorable the Board of Canal Commissioners.

GENTLEMEN :—

I have honor to submit to you a statement of the business connec with the superintendency of the motive power upon the Philadelp and Columbia rail road while under my charge, together with condition of the road and the state of the machinery. Under ordin circumstances a mere presentation of the tables and docume exhibiting the facts, might be all that my duty would require; but wretched condition in which the road was found by the undersign and the dilapidated state of the machinery render it necessary for I to go into a more detailed statement.

His duties commenced early in February last, at which time the road, from want of repairs was in such a condition as to render its management exceedingly difficult. In frequent instances, in making a single trip the engines were thrown several times from the track, thus causing delay to the public, trouble to the agents and expenses upon the motive power fund. This was overcome in due time by the industry and skill of the supervisors appointed by your Board, who, I am happy to state, have ever since their appointment been unremitting in their exertions to keep the road in proper repair. Another source of difficulty, and which in its effects has continued to the present time, is the want of funds to meet the immediate expenses of the road. By the last annual report of my predecessor, it will be seen that he credits the motive power fund with a balance of $30,231 80. How nearly correct this reported balance may be, will appear from the books of the Auditor General. From the date of that report until the 1st day of February 1839, the receipts of the motive power fund amounted to $31,045 60, and there was paid to Mr. Mehaffey the late superintendent by the State Treasurer, for moneys expended by him during that time the sum of $51,052 41 : and since my appointment the sum of $10,120 39 has been paid by me, for debts contracted by him. There are also some additional debts of his contracting still unpaid.

If we were to charge this reputed balance to credit of motive power, on the 1st of November 1838 with the stock on hand, when my predecessor came into office, of which there seems to be no account, we should find its existence only in his figures. But it is only my province to examine his accounts so far as they affect my own. For this purpose the statement of his account, which accompanies this, is presented. It will be seen then that the motive power tolls amounted, from November 1, 1838, till February 1st, 1839, to the sum of $31,045 60, and that there was expended during the same time, the sum of $61,172 80, thus leaving a balance against the fund in that short period of $30,127 20. Mr. Mehaffey claims a credit for stock on hand, when he retired from office of $22,844 08. But the valuation upon the items included in this inventory are his own, and he should have the credit of it, after deducting therefrom the inventory of stock on hand as reported by him on the 1st of November of the preceding year, which was $11,700 00, and the stock on hand to his credit would now be the sum of $11,114 08.

From the first of February 1839 till the first day of November the motive power tolls amounted to the sum of $153,970 80, of this sum I have received during the same time, the sum of $107,080 85—and I have paid for the expenses of the road the same sum. [See tabular statement]

It may be superfluous to state to the Board that the current expenses of the superintendent of motive power can only be paid from the tolls collected on its own earnings, and it will be seen that if the undersigned had received the amount earned during the time the road has been under his charge, instead of its having been diverted to the

payment of expenses incurred during a previous administration, he should have been able to meet all the demands upon it, and to point to a handsome surplus in the treasury.

It is proper to state, too, that a large sum earned by the motive power during the last nine months, did not come into my hands, in consequence of the failure of a Collector to pay it into the Treasury. The difficulties in relation to the funds were seized upon by the enemies of the road, and made to operate to the disadvantage of the Superintendent; and might have retarded his operations, if he had not, by the aid of his friends, been able to make advances in anticipation of the available funds of the road.

The entire receipts from motive power, during the year beginning with the 1st November, 1838, and ending with the month of October, 1839, have been $185,016 40; being an increase over the receipts of the preceeding year, of $20,963 66.

The great amount of this increased business was done in the two months immediately after the opening of the canals. In the latter part of the season, the business of the road has been operated upon by the deranged state of the currency, and the consequent difficulties in the commercial affairs of the country. But the present business on the road warrants the belief that it will every year increase, and that, with the system of economy and accountability introduced, the undersigned is confident in the belief that, hereafter, there will be yearly a large balance to the credit of the motive power department of the road. Another source of annoyance and inconvenience to the undersigned, was the bad condition in which he found the engines. By the report of the late Superintendent, he states that there were on the road, on the 1st November, 1838, twenty-seven engines in excellent repair, and nine in ordinary repair. Three months afterwards, I could find but six that were at all fit for service. Several others, that had been reported as in ordinary repair, had been either thrown into a back building, with those condemned as unfit for use and not worth repairs, or were only to be found in detached pieces about the different workshops. A table accompanying this, however, will show more particularly the condition of each one as reported, and their condition on coming into my charge, and the sum expended on each to put it in running order. In obedience to your directions to "see that the business of the road did not suffer or stop for want of sufficient engines," my first consideration was to increase the force in the different workshops, and to repair all the machines that were susceptible of use. For the purpose of still more expediting these repairs, several of the engines were sent to the shops of Mr. Baldwin, and Messrs. Eastwick & Harrison. It was soon, however, discovered, that all capable of being repaired, would be insufficient to accommodate the expected increase of business in the spring. To be prepared for it, it was believed that at least ten new engines would be necessary; and the vast amount of business done, shows that this calculation was not too great. I accordingly purchased from Peter Wager and Jonathan K. Hassinger, two engines and their tenders com-

plete, for $7,500 each, and one from William Badger, their agent, for the same sum. The three were manufactured by Henry R. Campbell, of Philadelphia, and are machines of the very highest order.—They weigh thirteen tons, and combine great strength and power with beautiful finish. Their performance has fully equalled all my anticipations. About the same time, two engines were ordered from the manufactory of Messrs. D. H. Doterer & Co. of Reading, which were placed on the road during the summer. They are engines of the largest class, are highly finished, and in their construction combine the essentials of strength, power and durability; and their performance will give to their enterprising makers such a reputation as their great enterprise and fine abilities, as machinists and mechanics, in my opinion, justly merit.

By a resolution of the board, I also purchased an engine, which had been placed on the road nearly a year before by Ross Winans of Baltimore, at the request of the late superintendent, and which was constructed for the use of anthracite coal as a generative of steam. It is constructed on a plan different from all others on the road. It has four driving wheels, upon which rests the entire weight of the machine without either trucks or guides. It has a vertical boiler and vertical flues, standing directly over the fire. The great anxiety existing for the use of anthracite coal upon the road and the perfect success with which this engine used it, after a fair trial induced the board to order another of the same construction with such improvements as might be suggested. It is in progress and is daily expected on the road. The peculiar construction of these machines gives them many advantages over others in the use of anthracite coal. The unusual space of fire box, with the boiler and tubes immediately over the fire, are advantages which are not to be had in any others. Indeed, in this improvement alone appears to be overcome the so much dreaded destruction of the fire box from the intense heat of the coal. The space being greater, a sufficient heat can be kept up with but a small quantity of coal over the grate, and thus prevent the dense heat which cannot be avoided when the contracted space of the fire box requires a greater depth of coal. Two were also purchased from William Norris and two from Messrs. Baldwin & Co. They are all machines of the first class. The deservedly high character for skill and ingenuity acquired by both these establishments, has been fully sustained by the performance of their engines. Those made by Mr. Norris have principally used bituminous coal with great success.

Should the business of next spring not be much greater than that of last, no more engines need be purchased for the use of the road.—Much, however, will have to be done in repairs and in rebuilding old ones. The attention of the workmen in the shops will be turned particularly to this subject, during the present winter, and I am warranted in the belief that by the opening of the spring trade we shall have a sufficient number ready for the greatest amount of business that may be expected. The appropriation by the last legislature not having been sufficient to meet the necessities of the road, after paying the large

debt with which it had been encumbered, the additional sum of $ will be necessary to buy new ropes and to discharge the balance due on engines. This sum, I am gratified in being able to state, will be most probably the last demand which need for years be made upon the liberality of the legislature. The proceeds of the motive power toll, will, so soon as that fund is relieved from the difficulties with which it has been encumbered, be sufficient to meet all demands upon it, as well as to renew and keep up all its own machinery. This could have been nearly done during the last nine months, had it not been embarrassed with previous debts, when the undersigned received it in charge.

The great anxiety evinced by your board, as well as by the citizens of a larger portion of the commonwealth, for the introduction of mineral coal as a fuel for generating steam in locomotive engines, induced me to give the subject a careful and attentive examination. After numerous experiments I am gratified in being able to inform the board, that the most perfect success has been attained.

During the summer various experiments were made, none of which entirely answered the purpose. The plan of Messrs. Eastwick & Harrison which had been used with tolerable success upon some short roads was fully tried, but would not answer here. This plan is a cast iron steam chest, placed over the exhaust pipes into which the "exhaust steam" is thrown, with a number of small tubes, through which the steam is made to escape and thus by driving a greater volume of air out of the smoke pipe, a vacuum is created, which must be filled by the rapid rushing of the air through the fire, by which a draft is kept up which assists it in burning the coal. This did very well while the engine was ascending a grade, or was upon a level; but so soon as it descended, the steam being shut off, there was no draft and the coal would become settled on the grates by the motion of the engine; and in descending a grade of several miles the fire would become so low, that steam could not be raised to ascend the next grade. Having succeeded thus far, it became evident that only one thing more was necessary to complete the experiment: this was to attach a fan or blower to the lower part of the engine, by which the fire could be kept up while going down grade, or while the engine was not in motion. This was done and produced the desired effect.

It may be well here to remark that the late superintendent had an engine fitted up for the use of anthracite coal, to which an additional engine was attached for driving a fan. But this experiment did not succeed, and was abandoned before the undersigned took charge of the road.

The plan now in use, is a very small rotary attached to the bottom of the boiler, which is driven by a small quantity of steam taken from its dome. The fan is enclosed in an iron casing, from which the air is conducted through a funnel to a perfectly tight iron chest, which encloses the whole of the ash pan. The air being forced into the chest, it is constantly working itself through the fire by the power of its own pressure, and thereby keeps up a constant blaze, and an amount of heat equal to all its purposes. This fixture was first tried upon a new engine called the "James Clarke," one of Mr. Baldwin's

first class machines. It has been making its regular trips for about six weeks, and as yet has given no sign of a failure. It has drawn very heavy loads at every trip, and has done its work with more apparent ease than when wood was used upon it as a fuel. As a test, the coal was weighed one trip. The engine drew twenty-two loaded cars, or one hundred and twenty-one tons, and consumed but one ton and a half of coal; and had it been of the purest quality, and well selected, the trip could have been made with a ton and a quarter, costing about seven dollars and twenty-five cents, while the same amount of freight, drawn by the same engine, would have required two cords of wood, which, including cording, cutting, and splitting, costs about eleven dollars This coal is from the Pottsville mines, and is the only anthracite which we have yet found to answer the purpose. I may also state that there is other coal of a similar quality, as convenient or more so, that will probably answer as well upon trial.

There are now, five engines upon the road, which are propelled by steam, generated with anthracite exclusively; and it is believed, that by the first of January, all the heavy engines upon the road will be ready to use it.

Numerous experiments have also been made in the use of bituminous coal. This, when it can be had of a pure quality, free from sulphur, and in masses large enough to prevent its falling through the grates, has been found to answer admirably by a very simple alteration of the grate bars. Four engines are now using it exclusively. Two are employed in drawing the day lines of passenger cars, and two on the night lines of passenger and freight cars. The best, and indeed the only bituminous coal which I have yet found fit for exclusive use in locomotives, is found on the West Branch of the Susquehanna river. Its great value was not, however, discovered until too late in the season to procure a suficient supply for the winter. Arrangements will be made for a full supply next season.

It is but justice to that distinguished citizen to remark, that I am much indebted to the Hon. Samuel D. Ingham, for information which has led to the success of my experiments in the use of mineral coal in locomotives; and my thanks are also due to Professor Espy for his experiments, and for information derived from him on the same subject.

I cannot close this subject without congratulating you, gentlemen, upon the success of a matter in which every portion of this state has a deep interest. The mere convenience, or the amount saved by the use of mineral coal upon this road, is of little importance compared with the advantages which must accrue to the commonwealth from it. The article of stone coal is, or will soon be, one of the great staples of Pennsylvania. It is found in exhaustless quantities in almost every section of the state and its use need only be properly established to bring it into demand in every state of the Union. The recent developements made in the successful manufacture of iron by anthracite, has done much to establish its value in a business, wherein its utility had been considered doubtful or impracticable, and the question

being settled as to its utility and economy in generating steam for locomotive and stationary engines, it is reasonable to suppose that it will ere long become an article of general use in every branch of industry wherein steam is used. This road is a very important one. Its operations are viewed with interest by the managers of every other road in the Union; and it is evident that if anthracite or bituminous coal can be used successfully and profitably upon a road of eighty-two miles in length, with very high and very long grades, our mineral will eventually be used on many other roads. The additional demand thus produced for our staple will not only have the effect of enriching a large class of citizens engaged in mining, but will do much towards improving some sections of the state which have hitherto derived but little advantage from the possession of it, and will also materially increase the amount of tolls on all the public improvements of the commonwealth.

Much inconvenience and difficulty exists in getting and retaining good workmen and experienced mechanics, in consequence of the machine shop being situated at a point in the country where no accommodations can be had for their families. Many of the best machinists are married men, who cannot take employment for want of dwelling houses in the neighborhood of their work. At Parkesburg, there are but three or four houses that can be had by the workmen, and those are not convenient, and there is but one public or private boarding house. Good workmen are always in demand, and when opportunity offers of rendering the condition of their families more agreeable, they will leave the employment of the State—making it necessary to fill their places with persons not so well qualified. The inconvenience, delay and actual loss thus occasioned, will, I apprehend, be found to amount to more than the interest of a sum necessary to erect dwellings at that place or to remove the establishment and erect a new workshop at the city of Lancaster, where the men could find their own dwellings. When it is recollected that at least twenty new houses would be required and that they would cost about $1500 each, and taking into consideration the present imperfect condition of the buildings, it will, in my opinion be found decidedly to be the interest of the commonwealth to remove the establishment at once. The present buildings were designed at a time when the vast amount of business now done upon the road was not anticipated. The buildings are now inadequate, and they will require repairs and additions with the yearly increase of business.

It is therefore respectfully suggested to the Board whether true economy would not be found in selecting a proper location, where a workshop could be erected of sufficient magnitude, to repair and rebuild all the engines that may be required by the road when performing the amount of business which it will probably the next year acquire.

In the event of a removal, the old building at Parkesburg might be used advantageously as a place of safety for several engines, which could be kept there in readiness for accidents occurring to engines in the neighborhood. The repairs of engines is a heavy item in the

expenses of the road, and the state shop should be made to do them at a less expense than they have heretofore cost. This can only be accomplished by having convenient shops, good machinery and every other convenience, to make the workmen comfortable and contented in their situations. The city of Lancaster would always afford to their families a desirable residence, and the property of the commonwealth would there have a great security against fire in its abundance of water.

During the hurry of business last spring it was with great difficulty that the trade of the road could be properly conducted from the fact of there being but a single track from the juncture of the West Chester road to the head of the Schuylkill plane. This difficulty must be increased, too, by the business next spring.

We are now, in consequence of it, compelled to start all the trains at stated hours, and after ten and a half o'clock cannot suffer a train to leave that point until after all the trains have arrived from Columbia. This is not until late in the evening, and in case of an accident or detention of any kind, to the cars going either way, the whole business of the road is retarded until the difficulty is corrected. This, in addition to the necessary delay and detention, produces much dissatisfaction among persons travelling over the road, who in their hurry to arrive at the end of their journey, seldom make allowance for any case of detention. I am pleased, however, to be able to inform the board, that notwithstanding the great amount of business done during the last season, but little detention occurred from this or any other cause. The whole business of the road was conducted with great regularity and despatch. It cannot, however, always be the case. We cannot calculate, with certainty, on doing successfully, the amount of trade done on this road, with so great an extent of single track, while it continues to be a highway open to the cars of every individual, and to be used with horse power, as is the case from the West Chester road to the plane. Private companies who own all the cars and have all the business under their entire control, may, to some extent, succeed with a single track.

The road around the Columbia plane has, within a few days, been so far finished as to enable the trains to get around; but the depot not being completed, the road cannot yet be used for the regular business. This, however, I am assured by the superintendent and engineer, under whose charge it has been, will be done in a short time. It will, at all events, be done in time for the spring trade, and will save a large expense and add much to the facilities of the whole road. This plane, however, has never been attended with so much trouble as the one at the Schuylkill. It is short, and what is of the utmost importance, in the management of a plane, it has been attended by men whose whole energies have been devoted to their duty, and who seemed to have no other wish than to carry out the views, punctually and faithfully, of the superintendent. During the whole time it has been under my charge, not a single difficulty or accident has occurred at it; but I regret that I cannot say so much for the Schuylkill plane. It was for a long time, from a variety of causes, a continual source of vexa-

tion and trouble. It is true that there have been but three accidents upon it; yet until recently, there has been much difficulty in getting the business done there with that degree of regularity and despatch, with which it was done at all other points of the road, I am gratified with the belief, that since the introduction of the safety cars which now precede the descent and follow the ascent of every train, with the reorganization of the agents, and the adoption of better rules and regulations, which were introduced at the same time, that every thing appears to move along with much regularity and entire safety to persons and property.

But although I now see very little danger or difficulty in managing that plane, yet the very fact of public opinion being decidedly against it, is sufficient to drive, annually, from the road, more business than would pay the interest on all the money required to avoid it. This is, of itself, worthy the consideration of the board, to say nothing of the other items of expense that would be saved to the commonwealth, and to its citizens, engaged in doing business upon the road, if it were dispensed with. It now requires, with the best management, three days to make a trip each way from Philadelphia to Columbia and back. If there were no plane to interfere, the same business could be regularly done in two days. The transporter would start his train of cars in the morning, from his ware house in Broad street, and in the evening of the next day his agents would return from Columbia with his cars, containing the produce of the west. In this way one-third less of the number of cars and one-third less of the number of agents would do the business now required, and in every other respect, except the toll, his expenses would be reduced to two-thirds of their present amount. The transporting merchant could then carry goods and merchandize for so much less, as to induce a vast increase of business to come over the road, which now seeks other avenues between the east and west, and enable us better to compete with our great rival, New York, whose trade is so much increased by the cheapness of transportation upon the lakes, which connect her canals with the trade of Ohio, Kentucky and Indiana.

The management of rail roads is fast advancing to a regular system; all who have had the proper experience, agree that no road should be made without sufficient strength to carry engines of the weight and capacity to do the greatest amount of business required to be done upon it; that none but first class engines should be used for carrying freight, and that those engines should be made to draw very heavy loads and to pass over the road at a very moderate speed. Any other kind of road or system of management, it is ascertained, will not answer the purpose. Small engines should never be used on long roads with high and long grades, unless for the mere purpose of carrying passengers. For this purpose engines of moderate weight are found to answer better than larger ones. The load is scarcely ever so heavy that they cannot pass over the road with ease, and the rapid motion does not effect them so much as it does others of greater weight.

It will be seen by the proper tables, annexed, that there have passed

the Columbia Plane, 52,664 cars, and over the Schuylkill Plane, 51,-156, during the year just ended, and that they were carried in 4,239 trips over the road, thus making three hundred and forty-seven thousand, six hundred and eight miles travelled in the year. This it will be seen, comprises only the through cars, of those which were taken on and left off at the different intermediate points, no account has been kept by the agents.

On reference to the proper table it will be seen that we have now on the road, thirty engines, either in excellent order, or tolerable repair, and ready for any service that may be required; and that we have six requiring to be entirely rebuilt, and which, until that is done, are unfit for any service. All this, however, can be done during the present winter. They will cost, as may be seen, between ten and eleven thousand dollars.

We are now running, daily, sixteen engines, and I have no doubt that the business of next spring will require at least thirty and for some weeks may require more. This will at best leave us but six engines on hand to meet accidents, ordinary repairs, and unexpected extras. This will be but a small proportion to have on hand, but still if the road is kept in tolerable repair during the spring, I think the business can be accommodated with that number.

The business of this winter has kept up far beyond that of any preceeding winter. We are now carrying about one hundred and twenty cars, each way every day, in addition to the passenger trains. About one half of this business is brought from the Cumberland Valley and Harrisburg rail roads. The balance is the ordinary business of the enterprizing citizens of Columbia, in lumber, whiskey and the produce of the surrounding neighborhood, returning with plaster, salt, fish and merchandize; and the way business arising from the exuberance of the late crops in the country bordering on the road from the Susquehanna to the Schuylkill.

But while the business of the road is now thus benefitted by the tributaries just mentioned, it is but just to remark, that the present condition of the Harrisburg and Lancaster rail road, warrants the belief, that unless very important repairs be immediately made, requiring a large expenditure of money, another season will find us very differently situated. Indeed, there cannot be a doubt, that unless those repairs be made, we shall have our line of communication, connecting with the Cumberland Valley rail road, entirely broken up, in consequence of the impassable condition of that portion of the road extending from its junction at Dillerville to Harrisburg.

It is therefore respectfully submitted to the board, whether the interest of the Commonwealth does not require that some measure should be taken to meet, in due time, the coming evil? Whether this is to be done by the laying of new tracks on the road now almost graded from Columbia to Harrisburg, and thus have an uninterrupted communication between the seat of government and the metropolis of the state, or by any other mode, is for the board, and the wisdom of the legislature to determine.

It may be proper to remark that among all the men now engaged on the Columbia rail road, whether as agents, mechanics, engineers, firemen or laborers, I know not one who does not prove himself, in every respect, worthy his situation. Indeed they are all sober, industrious, and in their respective situations, skillful and never refuse to perform any duty that may be assigned to them.

It may be proper to state in conclusion, that, in the management of a public road, so important as the Columbia rail road, so long and so connected with divers persons and interests, it is hardly to be expected that some complaints should not be heard. Some men may be found who may be actuated by interest, or personal or political hostility, who are actively engaged in misrepresenting facts, or in fabricating false facts, when none exist to misstate. With such men no course of conduct will be satisfactory. Every little error, accident or negligence of each subordinate officer or agent engaged in conducting operations on the rail road, is seized hold of and charged upon the principal officer, as a crime. This fact is so well known to the board, as to render any further explanation unnecessary. I will barely assert, and I do so with confidence, that during the last year, the efforts of those who have had the Columbia rail road in charge, have been as constant, faithful and unremitting to advance the public business, and to render that part of the improvements productive, as ever characterized its management; and that as few real grounds of complaint have been given to the public, as the circumstances would possibly enable the officers to avoid.

I have strained every nerve to discharge my duty with promptitude and fidelity to you and to the public, and I confidently appeal to all the candid and unbiassed persons, whose business has been transacted on this road to say, whether any thing has been wanting, on my part either in disposition or in action, which my ability and means enabled me to supply, to facilitate that business and give full satisfaction to all. The manner in which I have performed my arduous duty, I cheerfully submit to your honorable board.

JAMES CAMERON,
Sup't M. P. C. & P. Rail Road.

TREASURER'S ACCOUNT.

Balance on hand November 1st, 1838, as reported by the late superintendent,	$1,461 06¼
Amount received by him from November 1, 1838, to March 2d, 1839,	49,591 35
Total,	51,052 41¼
Amount disbursed by late superintendent from November 1, 1838, to February 14, 1839, as appears from his books,	51,052 41¼

Amount received by the present superintendent from the date of his appointment, February 1st to November 1st, 1839,	107,080 85
Amount disbursed and settled by Treasurer,	89,065 94
Balance,	$18,014 91

JAMES CAMERON IN ACCOUNT WITH THE COMMONWEALTH.

By amount of money paid and settled by Treasurer,	89,065 94
" " paid and vouchers held not yet settled by Treasurer,	18,014 91
Total amount of moneys paid by him,	107,080 85
To amount of moneys received by him from commonwealth up to November 1st, 1839,	$107,080 85

MOTIVE POWER ACCOUNT OF LATE SUPERINTENDENT.

Motive power expenses from November 1, 1838, to February 1, 1839, paid by him,	51,052 41¼
Motive power expenses paid by present superintendent, incurred under late superintendent,	10,120 39
Amount of stock reported by late superintendent to have been on hand November 1st, 1838,	11,700 00
Total Dr. for motive power during said three months,	72,872 80¼
By money earned by motive power from November 1st, 1838, to February 1, 1839,	31,045 60
Amount of stock reported by him to have been on hand February 1, 1839,	22,844 08½
Total Cr. for motive power during these three months,	53,889 68½
Deficiency in motive power,	$18,983 11¾

MOTIVE POWER ACCOUNT OF PRESENT SUPERINTENDENT.

By moneys earned by motive power from February 1st, 1839, to November 1st, 1839,	153,970 80
Amount of debts paid by him for late superintendent,	10,120 39
Amount of material on hand at Parkesburg shop, and stock along the road, such as wood and coal, November 1st, 1839,	10,500 00
Amount of repairs done to engines after February 1st, to render them fit for use,	9,156 28½
Total credits for motive power during these 9 months,	$187,747 47½

Motive power expenses paid from February 1st 1839, to November 1st 1839,	107,080 85
Amount of debt contracted during same period,	20,150 10
Stock on hand as reported by the late superintendent on February 1st,	22,844 08½
Total Dr. for motive power during these nine months,	150,074 93½
Amount of motive power gain,	$37,672 54

ABSTRACT STATEMENT.

Expended at Parkesburg shop,	$13,345 30½
Columbia "	1,390 50
Schuylkill "	768 00
Columbia plane,	7,854 00
Schuylkill "	8,601 50
For superintendent's, clerks, car inspectors, car agents, &c.	14,027 00
Engineers of Locomotives,	13,166 00
Firemen,	8,519 12½
Watermen,	6,061 00
Woodmen,	9,606 61½
By late superintendent for materials from Nov. 1, 1838, to Feb. 1, 1839,	12,736 30
Present " for materials from Feb. 1st to Nov. 1st 1839,	16,921 30
Late " " wood from Nov. 1, 1838, to Feb. 1, 1839,	10,550 52
Present " " " Feb. 1, 1839, to Nov. 1, 1839,	14,648 73
Late " " Oil from Nov. 1, 1838, to Feb. 1, 1839,	2,276 45
Present " " Oil from Feb. 1, 1839, to Nov. 1, 1839,	6,531 60
Late " for miscellaneous from Nov. 1, 1838, to Feb. 1, 1839,	466 82
Present " for miscellaneous from Feb. 1, 1839, to Nov. 1, 1839,	694 89
Late " for coal from Nov. 1, 1838, to Feb. 1, 1839,	2,369 75
Present " " " Feb. 1, 1839, to Nov. 1, 1839,	7,597 85¾
	$158,133 26¼

Statement exhibiting the names, duties, time of service, daily pay and amount paid each of the agents and men employed in the Motive Power department of the road during the fiscal year, ending 31st October, 1829.

Names.	Duties.	Time of service	Daily pay	Amount paid each.	Aggregate.
PARKESBURG SHOP.					
John Brant,	Master Machinist	75 days	$4 00	$300 00	
James T. Paxton,	Manager	68	2 00	136 00	
*James Boon,	Master Machinist	259	3 00	777 00	
*J. E. Jefferies,	Clerk and Manager	129	2 00	258 09	
Do	do	111	1 50	166 50	
*W'm Hardman,	Foreman	273	2 50	682 50	
Do	Machinist	52	2 10	112 32	
Henry Tallman,	Blacksmith	76	1 92	145 92	
Do	do	84	2 00	168 00	
W'm G. Hoagland,	do	5	1 25	6 25	
Do	do	77½	1 50	116 25	
Charles Irwin,	do	285½	1 87½	535 31¼	
John Quinn,	do	289¼	1 50	433 87½	
*J. M. Sample,	do	16½	1 25	20 62½	
Do	do	25¾	1 50	38 62½	
Do	Springsmith	24	1 25	30 00	
Do	do	67½	1 50	101 25	
Jacob Herrington,	do	6	1 67	10 02	
Isaac Stern,	Helper	249	1 50	373 50	
William Rees,	do	231¾	1 25	289 68¾	

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate,
PARKESBURG SHOP.					
John Olliver,	Helper	140 days	$1 25	$175 00	
John Franciscus,	do	39	1 25	48 75	
William K. Sloan,	do	261¼	1 25	326 56¼	
Charles Mellinger,	do	7	1 50	10 50	
Joseph Kinnard,	do	6	1 50	9 00	
George Maguire,	do	118¾	1 25	148 43¾	
John Larkin,	do	202¼	1 25	252 81¼	
Samuel C. Irwin,	do	64¼	1 00	64 25	
James G. Sample,	do	48½	1 25	60 62½	
Philip B. Ottey,	do	144½	1 25	180 62½	
Joseph T. Sample,	do	28¼	1 25	35 62½	
Henry Albright,	do	32	1 25	40 00	
William Carter,	Boiler maker	148¾	1 92	285 60	
James Rush,	do	131¼	1 92	251 46	
F. Lechler,	Coppersmith	52	1 50	78 00	
William Barton,	do	38	1 75	66 50	
Jacob Etter,	do	86¼	1 50	129 37½	
Charles Lay,	do	16¾	1 50	25 12½	
Andrew Headman,	do	33½	1 75	58 62½	
Bernard Devlin,	do	108¾	1 50	163 12½	
Joseph Forrey,	do	35½	1 33	47 21½	

Benjamin Franck,	Engineer, (stationary)	52 days	1 16	60 32
Do	do	257¼	1 50	355 87½
Joseph Hughes,	Wood worker	26	1 87½	48 75
Do	do	38	2 00	76 00
James McNamee,	do	271	1 33	360 43
Hiram Baldwin,	do	242⅓	1 33	322 52¼
Jacob Headman,	do	4	1 50	6 00
John Glassby,	do	50	1 25	62 50
Do	do	157¼	1 33	209 14½
George Bowman,	do	80	1 33	106 40
Daniel Okeson,	do	30	1 33	39 90
Samuel Bamford,	Machinist	273	1 75	477 75
David Pollock,	do	32½	1 75	56 87½
Do	do	8	2 00	16 00
Samuel Rue,	do	285¾	1 75	500 06¼
Charles Lyons,	do	24½	1 75	42 87½
George Hebel,	do	32½	1 66	53 95
John Wood,	do	152¼	1 75	266 43¾
Lambert Osmond,	do	253¼	1 50	379 87½
David Ralston,	do	205¼	1 50	307 87½
Charles Wood,	do	206¾	1 50	310 12½
Rob't S. Rashton,	do	106	1 16	122 96
Do	do	84	1 33	111 72
W'm Smith,	do	34½	1 75	60 37½
Geo. Yeager,	do	34	1 75	59 50
W'm Crawford,	do	34	1 75	59 50
Rich'd W. Williams,	do	188¼	1 75	329 43¾
Joseph Pollock,	do	160½	1 75	280 87½

STATEMENT—CONTINUED.

Names.	Duties.	Time of Service	Daily Pay.	Amount paid each.	Aggregate.
PARKSBURG SHOP.					
Samuel Ogden,	Machinist	11½ days	$1 62	$18 63	
Arthur M'Auley,	do	20½	1 75	35 87½	
James Hutchinson,	do	107½	1 67	179 52½	
Samuel Clayton,	do	41½	1 50	62 25	
W'm Vandegrift,	do	11½	1 50	17 25	
Thomas M'Donough,	do	23½	1 50	35 25	
John Watts,	do	123¼	1 67	205 82¾	
W'm G. Hoagland,	do	53¾	1 50	80 62½	
Samuel Taylor,	do	9¼	1 75	16 18¾	
W'm Boardman, J'r,	do	44	1 75	77 00	
Abner B. Stern,	Watchman	91 nights	1 00	91 00	
Isreal Pusey,	do	191	1 00	191 00	
Daniel M'Cullough,	Sweeper	92 days	1 00	92 00	
COLUMBIA SHOP.					$13,345 30½
George Eagles,	Foreman	3	2 00	6 00	
Daniel Stape,	Blacksmith	159	1 50	238 50	
Do	do	137	1 75	239 75	
Charles Hunt,	do	115	1 50	172 50	
Jeremiah Brown, J'r,	do	75	1 50	112 50	
N. Donnelly,	do	158	1 50	237 75	
Do	do	17	1 25	21 25	

John Eppinger,	do	139½	1 50	209 25	
Do	do	51	1 25	63 75	
James Bartlett,	do	59½	1 50	89 25	
SCHUYLKILL SHOP.					1,390 50
Ludwig Young,	Blacksmith	187	1 12½	210 37½	
John Slack,	do	25¼	1 50	38 25	
Francis Hays,	do	103	1 87½	193 12½	
Samuel Irwin,	Helper	91	1 25	113 75	
Joseph M'Gee,	Engin'r,station'ry engine	50	2 00	100 00	
John Charles,	Carpenter	75	1 50	112 50	
COLUMBIA PLANE.					768 00
H. Cassel,	Manager	63	2 50	157 50	
Joseph Bowman,	do	30	2 50	75 00	
Henry Mathiot,	do	245	2 50	612 50	
Abraham Varley,	Engineer,	190	2 00	380 00	
Jacob Downing,	do	64	2 00	128 00	
H. H. Bush,	do	80	2 00	160 00	
Martin Funk,	Fireman	189	1 25	236 25	
Nathaniel Hoon,	do	144	1 25	180 00	
John Jenks,	Rigger	324	1 50	486 00	
James Steele,	Telegraph man	72	1 25	90 00	
John K. Fidler,	do	30	1 25	37 50	
John Hippey,	do	72	1 25	90 00	
W'm Hippey,	do	72	1 25	90 00	
George Shreiner,	do	42	1 25	52 50	
John E. Collins,	do	259	1 25	323 75	
Henry E. Wolff,	do	263	1 25	328 75	
John Bennet,	do	263	1 25	328 75	

STATEMENT—CONTINUED.

Names.	Duties.	Time of service	Daily pay.	Amount paid.	Aggregate.
COLUMBIA PLANE.					
Joshua J. Gault,	Telepraph man.	263 days	1 25	$328 75	
Simon Kopp,	do	15	1 00	15 00	
Jacob Mellinger,	Watchman	56 nights	1 00	56 00	
Daniel Gallagher,	do	77	1 00	77 00	
Wilson & Caldwell,	Horse power			2,293 25	
Mullison & Collins,	do			187 50	
Francis Boggs,	do			942 00	
Daniel Herr,	do			198 00	
SCHUYLKILL PLANE.					$7,854 00
Solon Fleming,	Manager	35 days	2 50	87 50	
W'm Rice, J'r,	do	198	2 50	495 00	
Charles Nauman,	do	61	2 50	152 50	
Eli C. Williams,	Engineer, stationary	199	2 00	398 00	
Joseph M'Gee,	do	61	2 00	122 00	
W. W. Goodale,	do	92	2 00	184 00	
Henry Shearer,	Fireman	191	1 25	238 75	
George Crspin,	do	30	1 25	37 50	
Joseph M'Gee,	do	30	1 25	37 50	
James Griffith,	do	97	1 25	121 25	
Harrison,	Rigger	20	1 50	30 00	
Frederick Leak,	do	334	1 50	501 00	

Jesse B. Dale,	Attacher	89	1 25	111 25	
William Childs,	do	279	1 25	348 75	
Frederick Miley,	do	89	1 25	111 25	
Joseph M'Gee,	do	181	1 25	226 25	
Charles Wartman,	do	193	1 25	241 25	
Samuel Weisman,	do	245	1 25	306 25	
Levi Lukens, J'r,	do	235	1 25	293 75	
Andrew Brumaker,	do	92	1 25	115 00	
Thomas H. Patterson,	do	35	1 25	43 75	
William Thomas,	Telegraph man	334	1 25	417 50	
Charles Wartman,	do	62	1 25	77 50	
George Lambert,	Watchmen	61 nights	1 00	61 60	
Timothy Crowley,	do	28	1 00	28 00	
Paul Phy,	do	61	1 00	61 00	
Christian S. Snyder,	do	215	1 00	215 00	
William Conover,	Horse power			635 00	
John Greer,	do			809 00	
Grear & Overshine,	do			54 00	
S. Overshine,	do			1,273 00	
Andrew Lowrey,	do			768 00	
SUPERINTENDENTS, CLERKS, CAR INSPECTORS, AGENTS, &c.					8,601 50
Andrew Mehaffy,	Superintendent M. P.	33 days	4 00	132 00	
James Cameron,	do	273	4 00	1,092 00	
Thomas Dickey,	Clerk in Superin't office	99	2 00	198 00	
Jacob Broom,	do	68	2 00	136 00	
do	do	132	2 50	330 00	
Andrew Lowrey,	Manager Schuylkill level	137	2 50	342 50	

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
Sup'ts, &c.—Continued.					
William Rice, J'r,	Manager Schuylkil level	61 days	$2 50	$152 50	
Fabius Fleming,	do	35	2 50	87 50	
Charles Nauman,	do	57	2 50	142 50	
John Rogan,	Watchman	237	1 00	237 00	
Abraham Yousling,	State ag't passenger cars	71	2 00	142 00	
Hugh L. Pedan,	do	73	2 00	146 00	
John A. Kauffelt,	do	61	2 00	122 00	
Fabius Fleming,	do	61	2 00	122 00	
A. F. Cox,	do	22	2 00	44 00	
William A. Hambright,	do	263	2 00	526 00	
John W. Houston,	do	197	2 00	394 00	
Simon Alter,	do	13	2 00	26 00	
John C. Maxwell,	do	234	2 00	468 00	
Thomas B. Odell,	do	12	2 00	24 00	
Samuel S. Barton,	do	225	2 00	450 00	
John Mathiot, J'r,	do	238	2 00	476 00	
Peter Smith,	do	6	2 00	12 00	
Isacha Pugh,	do	222	2 00	444 00	
William B. Emerick,	Car inspector	61	2 00	122 00	
Frederick Dern,	do	79	2 00	158 00	
William W. Warner,	do	261	2 00	522 00	

John Hinkle,	Car inspectors	12	2 00	24 00	
Grabill Diller,	do	256	2 00	512 00	
George Minich,	do	120	2 00	240 00	
John Greer,	Superintend'nt of wood & water station near Schulkill plane.	51	1 50	76 50	
					7,900 50
BURDEN CAR AGENTS.					
Thomas B. Odell,	State agent burden cars	61	1 50	91 50	
John Lockard,	do	61	1 50	91 50	
John Cassel,	do	89	1 50	133 50	
William Evans,	do	70	1 50	105 00	
Henry Charles,	do	89	1 50	133 50	
John K. Fidler,	do	49	1 50	73 50	
Pennington Stoner,	do	57	1 50	85 50	
Sample Slaymaker,	do	127	1 50	190 50	
Nicholas Springer,	do	193	1 50	289 50	
Henry Brimner,	do	209	1 50	313 50	
James M'Laughlin,	do	149	1 50	223 50	
Joseph B. Sholfield,	do	91	1 50	136 50	
William Patton,	do	61	1 50	91 50	
H. P. Heintzleman,	do	61	1 50	91 50	
David H. How,	do	160	1 50	240 00	
William M'Chesney,	do	58	1 50	87 00	
Peter Smith,	do	249	1 50	373 50	
John Enney,	do	258	1 50	387 00	
John H. Brill,	do	242	1 50	363 00	
Adam Miller,	do	53	1 50	79 50	
John Lescure,	do	230	1 50	345 00	

STATEMENT—CONTINUED.

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
BURDEN CAR AGENTS.					
J. J. Monaghan,	State agent, burden cars	217 days	1 50	325 50	
Lorenzo Taggart,	do	35	1 50	52 50	
James Sailer,	do	214	1 50	321 00	
George W. Etter,	do	29	1 50	43 50	
Douglas Jones,	do	173	1 50	259 50	
Charles Rix,	do	26	1 25	32 50	
Jonas Ebey,	do	95	1 50	142 50	
William Blackburne,	do	197	1 50	295 50	
William S. Fichthorne,	do	78	1 50	117 00	
Mark Snyder,	do	61	1 50	91 50	
John Buchanan,	do	38	1 50	57 00	
do	Conductors state cars	52	1 25	65 00	
George Klinefelter,	do	136	1 50	204 00	
D. C. Barnitz,	do	121	1 50	181 50	
Jacob S. Sharpe,	do	10	1 25	12 50	
					6,126 50
ENGINEERS OF LOCOMOTIVES.					
John Millinger,	Engineer	73	2 00	146 00	
Henry E. Hebel,	do	89	2 00	178 00	
Edward A. Howard,	do	262½	2 00	525 00	
Isaac Bruce,	do	227	2 00	454 00	

Joseph Cockley,	Engineer	61	2 00	122 00
Daniel Holl,	do	71	2 00	142 00
Frederick Lunger,	do	46	2 00	92 00
Charles Mellinger,	do	50	2 00	100 00
William Beckley,	do	89	2 00	178 00
Allen Smith,	do	76	2 00	152 00
Isaac Dunn,	do	130	2 00	260 00
Kirk Few,	do	120	2 00	240 00
Beale Few,	do	238½	2 00	477 00
Isaac Martin,	do	106	2 00	212 00
Elisha Hamlill,	do	67½	2 00	135 00
Henry Holl,	do	28	2 00	56 00
Jacob Foltz,	do	147	2 00	294 00
Henry Rhoads,	do	72	2 00	144 00
Joshua Martin,	do	73	2 00	146 00
Rudolph Groff,	do	170	2 00	340 00
R. S. Hamlill,	do	198	2 00	396 00
Jenkins Few,	do	70	2 00	140 00
Smith Lake,	do	90	2 00	180 00
George Heagy,	do	6	2 00	12 00
John Day,	do	234½	2 00	469 00
John Carothers,	do	6	2 00	12 00
John Brandt, Jr.	do	3	2 00	6 00
Isaac P. Lewis,	do	122	2 00	244 00
John Trissler,	do	231	2 00	462 00
John Pelan,	do	146¾	2 00	293 50
do	do	30	2 25	67 50
John Slack,	do	208	2 00	416 00

STATEMENT—CONTINUED.

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
ENGINEERS OF LOCOMOTIVES.					
John Slack,	Engineer	20 days	2 25	45 00	
Jacob F. Wilson,	do	246	2 00	492 00	
Charles Lay,	do	9	2 00	18 00	
Abraham Pelan,	do	155½	2 00	311 00	
Joseph Brown,	do	185	2 00	370 00	
Thomas Sirlee,	do	73	2 00	146 00	
Joseph L. Parry,	do	101	2 00	202 00	
Henry Dehuff,	do	195	2 00	390 00	
George Snyder,	do	17	2 00	34 00	
James Martin,	do	10	2 00	20 00	
David Pollock,	do	144	2 00	288 00	
do	do	20	2 25	45 00	
Michael Kelly,	do	57	2 00	114 00	
Augustus Pelan	do	119	2 00	238 00	
James McKinley	do	29	2 00	58 00	
Richard Barrick,	do	182	2 00	364 00	
Evans Brinton,	do	68	2 00	136 00	
Christian Hukye,	do	41	2 00	82 00	
George Maxwell,	do	52	2 00	104 00	
Samuel Ogden,	do	214	2 00	428 00	
Jacob Downing,	do	69	2 00	138 00	

William Goodall,	do	51	2 00	102 00	
David Belven.	do	147	2 00	294 00	
Reuben Watts,	do	142½	2 00	285 00	
do	do	28	2 25	63 00	
George W. Brown,	do	20	2 00	40 00	
Henry Sheaff	do	59½	2 00	119 00	
Thomas M'Lellan,	do	153½	2 00	307 00	
George Murry,	do	26	2 00	52 00	
M. H. Mercer,	do	78½	2 00	157 00	
Henry H. Bush,	do	36	2 00	72 00	
Patrick Riley,	do	59	3 00	177 00	
George Maguire,	do	97½	2 00	195 00	
Hugh Maloney,	do	60	2 00	120 00	
Joseph M'Lellan,	do	34½	2 00	69 00	
FIREMEN OF LOCOMOTIVES.					$13,166 00
Isaac Martin,	Fireman	15	1 25	18 75	
George Heagy,	do	62	1 25	77 50	
John Day,	do	29	1 25	36 25	
Frederick Senatz,	do	180	1 25	225 00	
Isaac P. Lewis,	do	61	1 25	76 25	
Joseph Brown,	do	86	1 25	107 50	
Joseph Withers,	do	127½	1 25	159 37½	
William Christy,	do	166½	1 25	208 12½	
William P. Hannum,	do	258	1 25	322 50	
John Sanders,	do	57	1 25	71 25	
John Slack.	do	30	1 25	37 50	
Robert Robinson,	do	54	1 25	67 50	
Joseph Kinnard,	do	41	1 25	51 25	

STATEMENT—CONTINUED.

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
FIREMEN OF LOCOMOTIVES					
Joseph Hazlett,	Firemen	69 days	1 25	86 25	
George Maguire,	do	59	1 25	73 75	
Thomas Doud,	do	30	1 25	37 50	
George Snyder,	do	103	1 25	128 75	
James Martin,	do	169	1 25	211 25	
William Walling,	do	63	1 25	78 75	
William Blake,	do	84	1 25	105 00	
Paul Conard,	do	16	1 25	20 00	
George Hebel,	do	12	1 25	15 00	
Oliver G. Howard,	do	10	1 25	12 50	
George Crispin,	do	106	1 25	132 50	
Henry Rhoads,	do	28	1 25	35 00	
Jacob Foltz,	do	13	1 25	16 25	
John Franciscus,	do	195¾	1 25	244 68¾	
John Lewis,	do	13	1 25	16 25	
Christian Hakye,	do	58	1 25	72 50	
George Hamaker,	do	204	1 25	255 00	
George Maxtin,	do	198	1 25	247 50	
William Walker,	do	177½	1 25	221 87½	
James Cairns,	do	230	1 25	287 50	
Jacob Herrington,	do	39	1 25	48 75	

Augustus Pelan,	do	47	1 25	58 75
George Huffnagle,	do	168	1 25	210 00
do	do	27½	1 50	25 25
George Hambright,	do	184½	1 25	230 62½
J. D. Miller,	do	25	1 25	31 25
Henry Krise,	do	12	1 25	15 00
John P. Rudy,	do	10	1 25	12 50
Gerhard Brand,	do	5	1 25	6 25
Samuel Ogden,	do	31	1 25	38 75
John Wilhelm,	do	194	1 25	242 50
Frederick Bausman,	do	29	1 25	36 25
Michael Kelly,	do	28	1 25	35 00
Hugh Maloney,	do	145	1 25	181 25
James A. M'Cormick,	do	37	1 25	46 25
John Booth,	do	19	1 25	23 75
David Pearson,	do	67	1 25	83 75
Jacob Hart,	do	134½	1 25	168 12½
Nelson Benner,	do	43½	1 25	54 37½
Henry Bitner,	do	85	1 26	106 25
Joseph M'Lellan,	do	113½	1 25	141 87½
John Kulins,	do	145	1 25	181 25
Nicholas Springer,	do	65	1 25	81 25
John Smith,	do	7	1 25	8 75
Richard Barrick,	do	17	1 25	21 25
James Bartlett,	do	105¼	1 25	131 56¼
Evans Brinton,	do	38	1 25	47 50
Samuel White,	do	173¼	1 25	216 56¼
Michael Fagan,	do	58	1 25	72 50

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
FIREMEN OF LOCOMOTIVES.					
Caleb B. Gibbs,	Firemen	61 days	1 25	76 25	
John Semoyn,	do	30	1 25	37 50	
John Carothers,	do	28	1 25	35 00	
John Hartman,	do	58½	1 25	73 12½	
Henry Maurer,	do	50	1 25	62 50	
Henry Osmond,	do	69	1 25	86 25	
George Lockwood,	do	50½	1 25	63 12½	
J. M. Sample,	do	28½	1 25	35 62½	
do	do	23½	1 50	35 25	
Joseph Amos,	do	128¼	1 25	160 31¼	
M H Mercer,	do	100½	1 25	125 62½	
John Kantz,	do	22½	1 25	28 12½	
William Patton,	do	144	1 25	170 00	
F Carothers,	do	163½	1 25	204 37½	
W Buckley,	do	122	1 25	152 50	
do	do	23	1 50	34 50	
John Conn	do	8	1 25	10 00	
Bernard Devlin,	do	26½	1 25	33 12½	
Jesse Moore,	do	98¾	1 25	123 43¾	
Isaac Stern,	do	27	1 25	33 75	
Andrew Brumaker,	do	45	1 25	56 25	

Augustus Pelan,	do	47	1 25	58 75
George Huffnagle,	do	168	1 25	210 00
do	do	27½	1 50	25 25
George Hambright,	do	184½	1 25	230 62½
J. D. Miller,	do	25	1 25	31 25
Henry Krise,	do	12	1 25	15 00
John P. Rudy,	do	10	1 25	12 50
Gerhard Brand,	do	5	1 25	6 25
Samuel Ogden,	do	31	1 25	38 75
John Wilhelm,	do	194	1 25	242 50
Frederick Bausman,	do	29	1 25	36 25
Michael Kelly,	do	28	1 25	35 00
Hugh Maloney,	do	145	1 25	181 25
James A. M'Cormick,	do	37	1 25	46 25
John Booth,	do	19	1 25	23 75
David Pearson,	do	67	1 25	83 75
Jacob Hart,	do	134½	1 25	168 17½
Nelson Benner,	do	43½	1 25	54 3½
Henry Bitner,	do	85	1 26	106 25
Joseph M'Lellan,	do	113½	1 25	141 87½
John Kuhns,	do	145	1 25	181 25
Nicholas Springer,	do	65	1 25	81 25
John Smith,	do	7	1 25	8 75
Richard Barrick,	do	17	1 25	21 25
James Bartlett,	do	105¼	1 25	131 56¼
Evans Brinton,	do	38	1 25	47 50
Samuel White,	do	173¼	1 25	216 56¼
Michael Fagan,	do	58	1 25	72 50

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
FIREMEN OF LOCOMOTIVES.					
Caleb B. Gibbs,	Firemen	61 days	1 25	76 25	
John Semoyn,	do	30	1 25	37 50	
John Carothers,	do	28	1 25	35 00	
John Hartman,	do	58½	1 25	73 12½	
Henry Maurer,	do	50	1 25	62 50	
Henry Osmond,	do	69	1 25	86 25	
George Lockwood,	do	50½	1 25	63 12½	
J. M. Sample,	do	28¼	1 25	35 62½	
do	do	23½	1 50	35 25	
Joseph Amos,	do	128¼	1 25	160 31¼	
M H Mercer,	do	100½	1 25	125 62½	
John Kantz,	do	22½	1 25	28 12½	
William Patton,	do	144	1 25	170 00	
F Carothers,	do	163½	1 25	204 37½	
W Buckley,	do	122	1 25	152 50	
do	do	23	1 50	34 50	
John Conn	do	8	1 25	10 00	
Bernard Devlin,	do	26½	1 25	33 12½	
Jesse Moore,	do	98¾	1 25	123 43¾	
Isaac Stern,	do	27	1 25	33 75	
Andrew Brumaker,	do	45	1 25	56 25	

John B. Menough,	do	131¾	1 25	164 68¾	
Henry Kreuson,	do	116	1 25	145 00	
S. G. Musser,	do	119	1 25	148 75	
James G. Sample,	do	87½	1 25	109 37½	
WATERMEN.					8,519 12½
Gerhard Brand,	Watermen	72	1 00	72 00	
Michael Zieffley,	do	72	1 00	72 00	
Paul Trout,	do	116	1 00	116 00	
Andrew Trout,	do	71	1 00	71 00	
John M. Ford,	do	89	1 00	89 00	
Samuel Bricker,	do	78	1 00	78 00	
Peter Donnelly,	do	89	1 00	89 00	
James Pyott,	do	89	1 00	89 00	
Major Whiteside,	do	89	1 00	89 00	
Mahlon Robinson.	do	100	1 00	100 00	
Jacob Ricksten,	do	273	1 00	273 00	
Joseph Irwin,	do	89	1 00	89 00	
John Irwin,	do	89	1 00	89 00	
Conrad Collage,	do	88	1 00	88 00	
John Kelmer,	do	87	1 00	87 00	
Thomas Ross,	do	89	1 00	89 00	
Samuel Kittzleman,	do	30	1 00	30 00	
Joseph Lewis,	do	233	1 00	233 00	
Andrew Lewis,	do	233	1 00	233 00	
John Trissler,	do	22	1 00	22 00	
Thomas Hughes,	do	27	1 00	27 00	
Jacob Rees,	do	234	1 00	234 00	
Jacob Uffner,	do	233	1 00	233 00	

STATEMEENT--CONTIUED.

Names.	Duties.	Time of service	Daily pay	Amount paid each.	Aggregate.
WATERMAN.	WATERMAN.				
L. R. Humpton,	do	61 days	100	61 00	
William Lewis,	do	226	1 00	226 00	
George F. Coffee,	do	31	1 00	31 00	
John McCullough,	do	31	1 00	31 00	
Samuel Irwin,	do	31	1 00	31 00	
John Pickering,	do	31	1 00	31 00	
John Strien,	do	122	1 00	122 00	
James Hutchinson,	do	215	1 00	215 00	
Samuel Cooper,	do	31	1 00	31 00	
Samuel Burnett,	do	245	1 00	245 00	
Henry Campbell,	do	245	1 00	245 00	
John Campbell,	do	215	1 00	215 00	
Adam Fullerton,	do	242	1 00	242 00	
N. M'Gonigle,	do	19	1 00	19 00	
Jacob Ricksten, Jr.	do	4	1 00	4 00	
Samuel Crooks,	do	214	1 00	214 00	
James Irwin,	do	214	1 00	214 00	
James Corcoran,	do	61	1 00	61 00	
Arthur M'Glade,	do	118	1 00	118 00	
John Drenan,	do	119	1 00	119 00	
George Jones,	do	127	1 00	127 00	

Jackson M'Cullough,	do	38	1 00	38 00	
John Kittleman,	do	2	1 00	2 00	
John Kountz,	do	126	1 00	126 00	
William Tweed,	do	181	1 00	181 00	
Hans Olsen,	do	180	1 00	180 00	
E. S. Bowen,	do	176	1 00	176 00	
N. Nigh,	do	54	1 00	54 00	
David Pearson,	do	2	1 00	2 00	
William Oldham,	do	46	1 00	46 00	
George Lex,	do	31	1 00	31 00	
Paul Phy,	do	31	1 00	31 00	
WOODMEN	Woodmen				$6,061 00
George Geiger,	do	61	1 00	61 00	
Jacob Wagner,	do	61	1 00	61 00	
Jacob Ocks,	do	61	1 00	61 00	
Peter May,	do	35	1 00	35 00	
Michael Brode,	do	61	1 00	61 00	
Henry Dietz,	do	61	1 00	61 00	
Absolom S. Keen,	do	76	1 00	76 00	
Thomas Hughes,	do	55	1 00	55 00	
Joseph Engleman,	do	76	1 00	76 00	
Frederick Folen,	do	76	1 00	76 00	
William M'Creddin,	do	76	1 00	76 00	
George Seuatz,	do	26	1 00	26 00	
Samuel Kitzleman,	do	55½	1 00	55 50	
Thomas H. Patterson,	do	42	1 00	42 00	
Matthew Ferguson,	do	13½	1 00	13 50	
Robert Cunningham,	do	60	1 00	60 00	

STATEMENT—CONTINUED

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
WOODMEN.					
Christian Miller,	Woodmen	8 days	1 00	8 00	
Joseph Seuatz,	do	50	1 00	50 00	
Frederick Seifried,	do	225	1 00	225 00	
Adam Knissel,	do	279	1 00	279 00	
Casper Yeager,	do	178	1 00	178 00	
M. Beaver,	do	279	1 00	279 00	
Edward Flinn,	do	205	1 00	205 00	
Samuel Moore,	do	202	1 00	202 00	
James Armstrong,	do	31	1 00	31 00	
David Parke,	do	31	1 00	31 00	
John Drennan,	do	26	1 00	26 00	
James Corcoran,	do	26	1 00	26 00	
John Corcoran,	do	53	1 00	53 00	
John Divine,	do	56	1 00	56 00	
George Lex,	do	182	1 00	182 00	
George Lewis,	do	209	1 00	209 00	
Edward Moran,	do	209	1 00	209 00	
William Oldham,	do	153	1 00	153 00	
George Jones,	do	22	1 00	22 00	
Thomas Roche,	do	22	1 00	22 00	
William Flood,	do	15	1 00	15 00	

Robert Woods,	Hauling wood	35	1 12½	39 37½
Henry Hays,	Woodmen	3	1 00	3 00
Arthur M'Glade,	do	7	1 00	7 00
William Rankin,	do	55	1 00	55 00
Thomas Seifried,	do	183	1 00	183 00
N. Nigh,	do	112	1 00	112 00
James O'Brien,	do	53	1 00	53 00
Godfrey Hess,	do	23	1 00	23 00
Conrad Krodel,	do	101	1 00	101 00
Eli M'Cann,	do	1	1 00	1 00
George Strouse,	do	1½	1 00	1 50
Samuel Breckenridge,	do	1	1 00	1 00
Paul Phy,	do	67	1 00	67 00
M. Haveline,	do	4	1 00	4 00
James Armstrong,	do	1½	1 00	1 50
S. C. Neily,	do	111	1 00	111 00
John Hutchinson,	do	8	1 00	8 00
M. Richards,	do	54	1 00	54 00
William Flood,	do	2	1 00	2 00
S. Meharry,	do	3	1 00	3 00
Johsua Evans,	do	8	1 00	8 00
James Moran,	do	26	1 00	26 00
William Sweeton,	do	110¾	1 00	110 75
Daniel Rees,	do	406¼ cords	87½	355 47
William Dunn,	do	155⅝	1 00	155 62½
do	do		87½	127 47
do	do	9	12½	1 12½
Peter Ingraham,	do	84⅜	1 00	81 37½

STATEMENT—CONTINUED.

Names.	Duties.	Time of service	Daily pay.	Amount paid each.	Aggregate.
WOODMEN					
Eli M'Cann,	Woodman	103¼ cords	1 00	103 25	
do	do	123¼	87½	107 84½	
do	do	53½	12½	6 68¾	
Nathaniel Rue.	do	76½	1 00	76 50	
James Scott,	do	72½	1 00	75 50	
Thomas Griffith,	do	63½	1 00	63 50	
do	do	111½	87½	97 56½	
Oliver P. Ross,	do	180⅝	1 00	180 62½	
do	do	102½	87½	89 68¾	
Michael M'Dermott,	do	28	1 00	28 00	
James Armstrong,	do	30¼	1 00	30 25	
do	do	320	87½	280 76½	
do	do	729⅝	12½	91 19¾	
David Parke.	do	125⅗	1 00	125 37½	
do	do		87½	300 73¾	
do	do	228	18¾	42 75	
do	do	185⅞	12½	23 12½	
William Sweeton	do	54	1 00	54 00	
do	do	47¾	87½	41 78	
Thomas Roche,	do	48	1 00	48 00	
do	do	105⅗	87½	105 87½	

J. Hutchinson,	do	269½		87½	235 81½	
do	do	25		1 00	25 00	
Peter Donley,	do	20		1 00	20 00	
do	do	21¾		87½	19 03	
Lytle and Mehany,	do	47¾		1 00	47 75	
James Lytle,	do	31½		1 00	31 50	
do	do			87½	326 26¼	
Samuel Breckenridge,	do	150⅜		1 00	150 37½	
William Rankin.	do	122¾		1 00	122 75	
Samuel Mehany,	do	266¾		1 00	266 75	
William Flood,	do	84		1 00	84 00	
Elijah Louden,	do	70		1 00	70 00	
Christopher Super,	do	60½		1 00	60 50	
George Strouse,	do	144½		87½	126 43¾	
L. R. Humpton,	do	68¼		87½	59 71¾	
E. Gipple,	do	94⅛		87½	94 12½	
Samuel Dennis,	do	406¼		12½	50 78	
Overshine & Billmyer,	Hauling wood				75 00	
Joseph Evans,	do	16		62½	10 00	
Benjamin Kughler,	do				68 46¾	
James Smith,	do	96		15	14 40	
Morgan L. Rees,	do				4 00	
John Hipple,	Inspector and measurer		days	2 00		
William Hambright,	Agent, wood cars	119		1 25	148 75	
do	do	92		1 50	138 00	
Joshua Darlington,	do	178		1 25	222 50	
H. R. Mifflin,	do	101		1 50	151 59	
						$9,606 61½

[No. 6.]

ALLEGHENY PORTAGE RAILROAD.

REPORT OF WM. E. MORRIS, ENGINEER.

This improvement is thirty-six and two third miles in length.—Since its opening for transportation, in April last, the business upon it has not suffered a day's interruption.

It has been found necessary to keep employed during the season a heavy force of hands, in cleaning out drains and removing hill slips, in adjusting the superstructure, renewing decayed timber, and introducing additional cross-ties.

To each of these items of work, more or less repair must be done next year. The adjustment of the track is in fact an annual charge, and one unavoidable upon this road, from the nature of the soil, the great number of springs, and the severity of the winters. The amount usually required for this purpose, however, may be considerably diminished by thorough draining. To this object, important upon all roads, and particularly so upon the Portage, much attention has been directed this season. The spreading apart of the rails has been a very productive cause of vexatious delay, and has rendered an extensive introduction of additional cross-ties necessary. Upon portions of the road, many will be required the ensuing year. Much of the timber used in the construction of the road, has become so much decayed as to need renewal. Locust cross-ties, few of which were originally placed in the work, are now *exclusively* used.

To replace those decayed, and furnish the necessary additional cross-ties, about seven hundred new ones will be required per mile, amounting for all that part of the road usually designated as "the levels," 23,000 sills, cost forty cents each. Drains will cost $50 per mile; Adjusting track and inserting new sills, $300 per mile.

Estimated cost, $21,000 00

The superstructure upon inclined planes consists of timber cross-ties and rails, and the plate bar. This requires to be *almost entirely relaid.* The decay of the timber has progressed to such an extent, that when the ground is soft and the timber wet, the rails yield at many points beneath the pressure of the car wheels from ½ to 2½ inches. They have been suffered, no doubt, to fall into this state, from the expectation that the legislature would provide for their repair with an iron rail, instead of the wooden track. The last legislature made no provision for this purpose.—Much new timber was indispensable to keep the planes in business order during the season. The next legislature would not meet until 7th of January, 1840, and should the funds be then appropriated, the rails could not be procured and laid in time for the commencement of the next year's business. I therefore directed the Supervisor to provide materials for a

thorough repair of the track of the planes, upon their *present plan.* It is of the utmost importance that the inclined planes, and the machinery connected with them, should at all times be in the best possible order. The amount of tonnage that can be passed upon them, regulates the business capacity of the whole road. This depends upon the effective power of the stationary engines, the quality and strength of the ropes, and the state of the track. Want of adjustment or firmness in the latter, extends its effects to both the engine and the cordage—increasing the power necessary to move the train, and the stress upon the ropes causing a greater wear to both. To re-lay the entire length of the planes, and at the same time keep open the road, could not cost less than $24,000. At least one third must be done next year.

Estimated cost, $8,000 00

To reduce as much as practicable the first cost of this road, the cast iron chairs used in its contruction were imported from England. Experience, however, has proved it false economy.—The metal was high and brittle, and the chair light. The consequence has been, that at least one half have failed, and have been replaced by a heavier article made of domestic metal of far better quality. The latter seldom break by fair usage. New chairs are also required wherever the additional cross-ties are inserted. A large proportion of the burthen of this change has fallen upon the present season, and much must be sustained during the ensuing year. Another cause of the increased expense of castings, is the great number of sheaves that are so much broken as to be useless. Most of these have been injured by the sheave frame having been suffered to become loose.—Nearly every sheave upon the road that has not been re-set this summer, will require re-setting next season. One instance may be mentioned: out of one hundred and eighty sheaves upon plane No. 6, fifty only were fit for re-setting.

Estimated cost of castings for 1840, including sheave frames and setting, $7,000 00

The arch of the viaduct over mountain branch of the Conemaugh has settled several inches during the past summer, and gives indication of falling. To repair it permanently, the arch should be rebuilt, which would cost about $1,200. But there having been a wooden support placed upon the abutments, and extending over the arch, it may be left in its present state another year, or more.

Repairs are necessary to two culverts—the slope wall at plane No. 7, and at the big viaduct. An extension of the Depot at Johnstown is much needed. The engines in active service during the summer need overhauling. This can be well done only at Johnstown; and when there a portion must stand exposed to the weather.

Estimated cost, $3,500 00

The masonry connected with the stationary engines needs some general repair. Two stacks must be rebuilt, and the brick in that part of the flues, most exposed to the fire needs renewing. Some repairs is also necessary to the dwellings, at head and foot of planes.

Estimated cost, $3,000 00

RECAPITULATION.

Drains, adjusting tracks, renewing superstructure, &c.,	21,000 00
Relaying tracks upon planes,	8,000 00
Castings for chairs and sheaves, frames, &c.	7,000 00
Slope wall, culverts, enlarging depot, &c.	3,500 00
Stacks, flues, and dwelling,	3,000 00
	42,500 00
Contingencies,	3,500 00
Total,	$46,000 00

The injury done by the "freshet" of June 1833 to the Hollidaysburg viaduct, has not been repaired. Neither have any steps been taken to construct additional passages for the water. The present openings are not sufficient to discharge extreme floods. Justice to the people of Gaysport and the safety of the public works equally demand an enlargement of the water way of this viaduct.

Estimated cost. $1,000 00

The motive power department has been conducted upon the system adopted in 1835, and continued since; viz. by locomotive power upon the longer levels, and by horses upon the shorter. With the average number of cars heretofore passed upon the road, this plan is the most economical, and for burden trains equally expeditious; no further introduction of motive power is at present recommended.

The "levels" upon which steam power is employed, require in active service twelve locomotives. To keep up this number, seventeen have been provided. Three of these commenced running 10th May 1835, and have been in service five years. Five in the spring of 1836, and have been in service four years. Seven in the spring of 1837, and have been in service three years. No new locomotives have been placed on the road since the spring of 1837. And $10,000 only, of the $100,000 appropriated by the last legislature for ropes and locomotives upon the Columbia and Portage roads, have been received here. This has been applied towards the purchase of ropes.

Most of these engines are second and third rate. Many of them are much worn and shattered, three have been entirely rebuilt, and one is useless. With seventeen locomotives, situated as these are, the requisite number, cannot be kept in good working order, upon the road. Two new locomotives of the first class should be provided early next season. These will cost when put up in running order upon the road, about $16,000.

Much difficulty has resulted this summer, from the very inferior quality of the ropes. Breaking the rope has been a common occurrence, and extensive injury to the transporter, has only been prevented by the almost perfect security, furnished by the "safety car." New ropes have been placed upon planes No. 1, 6 and 10, within the last three months. Others have been provided for five planes. The

remaining two must be supplied, early in the spring; an additional one will be required to enable the three first mentioned to last throughout the season. The average cost of a new rope, laid upon the planes is $3,000. Cost of eleven ropes $33,000.

The ropes are a heavy annual expense to the commonwealth, which, if practicable, it would be very desirable to lessen. Various plans have been suggested to accomplish this object, some of which have been put to the test of experiment. But none within my knowledge have met with success. Roofing the planes remains yet to be tried. That the durability of cordage is much increased by protection from wet and sun, none can deny: and few who witness the slight effect of friction upon the ropes in use on the planes in good weather, and their rapid destruction when wet, can doubt but a roof would double their durability. The cost of repair to the track itself, would be reduced one third. A source of danger to cars and injury to the ropes, resulting from a coating of ice, would be avoided, and the capacity of the planes themselves in some degree increased. A good roof will last with little repair, twelve years; would cost about $3 per foot lineal. Roofing a plane 2000 feet in length, would cost $6000.

I would respectfully suggest to the Board the propriety of making the experiment at one plane.

Portions of the boilers of the stationary engines will soon need repairs at those parts most exposed to the action of the fire. Any new iron that they require, should be worked on the road. This cannot conveniently be done without a set of instruments for the purpose. They consist of a pair of shears, a punching instrument, and a set of rollers.

Estimated cost, $500 00

RECAPITULATION.

2 new locomotives,	$16,000 00
Balance of cost of ropes for 1840,	23,000 00
Instruments for working boiler iron,	500 00
	$39,500 00

The exact situation of the motive power fund has not yet been ascertained; but it is believed sufficient to meet every other demand upon it.

Should the increase of business upon the main line, anticipated upon the completion of the Susquehanna and Tide Water canal and the Ohio connexion, be realized during the ensuing year, little doubt remains but the motive power will be able to contribute towards the purchase of ropes and locomotives, unless made liable for debts contracted previous to the spring of 1839.

Respectfully submitted,

WM. E. MORRIS.

[No. 7.]

Report of J. Snodgrass, Superintendent of Motive Power, Allegheny and Portage Rail Road.

To the Board of Canal Commissioners.

According to instructions, received from the secretary of your board, I have the honor to transmit the following report of the operations of the Motive Power department, of the Allegheny Portage rail road, during the portion of the year it has been under my charge.

My appointment as superintendent was made on the 9th of February, 1839, and I took charge of that work on the 15th of the same month. There were then upon the road seventeen locomotives, the largest portion of which, from having been used on the Columbia rail road, previous to the year 1835–6, and constantly upon this road since that period, required extensive repairs to render them fit for the business of the then approaching spring, which would require at least twelve of them for immediate use.

I found the stationary engines at the planes in tolerable good order —the engines at planes, 4, 5, and 6, needed some extraordinary repairs. The road was opened on the 21st of March, and has continued in operation without the least interruption, up to the present time. There having been a great press of business on the canal, during the first part of the season, I deemed it advisable to work the road 18 hours during the day; by this means I was enabled to pass the burthen trains over the road in one day, an object almost indispensable to enable the transporters to convey the freight as offered, with their limited number of cars. This caused a slight increase in the expense of working the road, but by no means to be compared to the consequent advantages derived by the other parts of the public improvements, in passing at once, all freight presented, over this important connecting link.

Although there is no doubt, but that there is a practical limit to the amount of work that can be performed by this road; still, its capacity is so much above what it is at present called upon to perform, or, which may be expected for many years to come, that I think there need be but little fear entertained of this climax. Plane No. 8, the longest and steepest of any on this improvement, may be considered as the limiting plane, for whatever work it can do may be done by the rest of the road. A safe calculation that may be depended on by the public, allowing 8 minutes to pass a train of 4 cars or 14 tons of merchandise, each way over it, working the plane 24 hours, gives 2520 tons per day, and 630,000 tons per year, of 250 days. During the last year, the greatest tonnage passing one way, was about 60,000 tons. It is to be remarked, that the cost of motive power, will

not by any means increase in proportion to the amount of business on the road, for when this approaches its limit, the cost of working planes will be only doubled to do ten times as much work. Let it be remembered, then, that the Allegheny Portage, has never yet had work enough to do, to give it at all a fair comparison with other works, without inclines.

I can give but little information, in regard to the "old debts," As near as I can ascertain, from my predecessor, and other sources, they amount to the gross sum of $30,089 96¼

George S. King, of Johnstown, received on vouchers, which were taken to Harrisburg by himself, and audited by N. P. Hobart, then Auditor General, and entered to my credit by D. Sturgeon, Esq., State treasurer, on the 11th of May, 1839,	$1,408 29	
Smith & Guthrie, of Pittsburg, were paid on ac't of ropes, contracted for by my predecessor,	4,500 18	
		5,908 47
Amount due of old debts,		$24,181 49½

The expenses of working the road, from the 15th of February, to the 31st of October, 1839, are as follows, viz:

Abstract statement.

Expended at Johnstown Depot,		$3,981 43¾
do	Inclined plane No, 1,	1,715 56¼
do	do " 2,	1,776 97½
do	do " 3,	1,730 87¼
do	do " 4,	1,809 12½
do	do " 5,	1,913 68¾
do	do " 6,	1,901 00
do	do " 7,	1,890 43¾
do	do " 8,	1,806 50
do	do " 9,	1,841 00
do	do " 10,	1,852 25
do	on Johnst'n level for loco'm, runners & firemen,	1,519 15¼
do	Long level, do do do	2,531 06
do	Level between No. 4 & 5 do do	1,470 56¼
do	" " " 9 & 10 do do	1,484 93¾
do	Hollidaysburg level, do do	1,659 62½
do	at Rigger's loft,	1,531 18¾
do	Summit smith shop,	752 56¼
do	for repairing stationary engines,	718 96¾
do	Car conductors,	581 56¼
do	at wood shed at Johnstown,	912 75
do	do half way house,	763 53

Expended at woodshed at plane No.				1,	1,011 55¼
do	do	"	"	2,	1,292 46
do	do	"	"	4,	792 87½
do	do	"	"	9,	514 62½
do	do	"	"	10,	625 43¾
do	for switch and water station tenders,				652 87½
do	at Hollidaysburg depot,				829 81¼
do	for superintendent, clerk, state agents &c.				4,482 00
do	horse power,				17,664 87¼
do	coal for stationary engines,				5,154 51
do	cord wood for locomotives, &c.				2,678 62½
do	oil and tar,				2,505 19½
do	miscellaneous items,				6,888 11¾
Amount expended from the 15th Feb. to Oct. 31, 1839,					$81,146 67

For a list of the agents employed in this department, I will refer you to the table marked No. 1: table No. 2, will show the monthly and aggregate expenditures for horse power. No. 3, will show the quantity of coal used, and the cost of the same. No. 4, shows the amount of wood purchased for locomotives and its cost. No. 5, will show the cost of oil and tar. No. 6, exhibits a list of miscellaneous accounts.

The contracts entered into this season with Smith and Guthrie, of Pittsburg, for ropes for eight planes has been complied with, except the delivery of a few coils, which will be delivered in a short time; the whole of which will amount to about $25,00 0.

The sum of $10,000 has been drawn out of the fund appropriated for the purchase of ropes, and paid for part of what has been delivered. I would here remark, that there has never been rope on this road of so good a quality, both as respects *workmanship* and *material*, and I think I am safe, in saying, that they will last at least a season and a half in actual service.

It will be necessary to contract for eleven new ropes in 1840, the weight of which will be 163,325 pounds, which at 21 cents per pound, will amount to $34,298 25. This sum will be required, provided there is no reduction in the price of the best quality of Russia hemp. I would respectfully suggest a speedy appropriation for this purpose.

Four new locomotive engines will be required on the Portage next season, the cost of which will be about $30,000, for which I would also ask a special appropriation.

I would respectfully suggest the propriety of dispensing with the appointment of "State Agents" for passenger cars upon this road, as I believe, that their services are by no means adequate to their salary. I would urge the propriety of the state furnishing passenger cars, sufficient to accommodate all persons travelling upon this great thoroughfare. The transportation of passengers is at present, but a small item of the revenue, but it is still sufficient to afford a great deal of trouble, in case they do not arrive regularly, by interfering in

the regular routine of business, and frequently causing much loss of time in expediting the other business of the road. Arrangements are particularly necessary upon a road with ten inclined planes, by the states' furnishing the cars and transporting the passengers, this regularity could always be ensured.

The revenue to the state is at present, about seventy-two cents per passenger; the companies charge two dollars—this would yield a very handsome advance in toll, with but a slight increase of the first cost, and would still do so, if the fare should be considerable reduced; and I have no doubt that the owners of the packet lines would, by the state charging them a fair compensation for carrying their passengers over the road, be considerably the gainers.

It has been customary on this road, for foremen to be employed at the different wood sheds, and the sawing done by the day; by dispensing with the same, and letting the sawing by the cord at the different points, will save to the state, $2,000 per year—which course I intend to adopt.

It affords the undersigned much pleasure, under all the circumstances of the heavy expenditures that must be on this road, on account of ten inclined planes, twenty stationary engines, machinery complicated, part with steam, and part with horse power; to be able to inform the board, that the excess of motive power toll over expenditures, is $15,370 11.

It will be reasonable to conjecture, providing the state procures the passenger cars on this road, together with the anticipated increase of trade in the year 1840, for the motive power tolls to amount to $140,000, which will be quite sufficient afterwards, to pay all expenses, including ropes and locomotives.

Table No. 7, exhibits the names of locomotives on this road, by whom made, when commenced running, their cost, present state, number of days they run this season, &c.

It gives me pleasure to bear witness to the efficient aid which has been afforded me, by Mr. Joseph G. Bridges, principal machinist in the depot at Johnstown, and by the other officers of the road.

All which is respectfully submitted,

JOHN SNODGRASS,

Superintendent, Motive power, Allegheny Portage Rail Road.

Statement of Motive Power, Tolls and Expenditures.

Amount of motive power tolls collected at Johnstown, from the 21st of March, to the 31st of Oct. 1839.	$30,237 85	
Amount of motive power toll collected at Summit, during the same time,	2,122 69	
Amount of motive power toll collected at Hollidaysburg, in same time,	57,356 24	
		$90,716 78

Amount expended for motive power operations, during the same period,		$81,146 67	
Deduct amount of stock on hand at this time, more than on the 15th day of February, such as iron, steel, tar, oil, wood, coal, &c.	$4,000 00		
And forty-five tons of old rope at $40 per ton,	1,800 00		
		5,800 00	
			75,346 67
Actual excess over expenditure,			$15,370 11

Statement showing the account of the Superintendent.

Amount expended from the 15th of February, to the 21st of Oct. 1839,	$81,146 67	
Amount paid on *old debts* out of motive power fund, which does not properly belong to it,	5,908 47	
		$87,055 14
Amount drawn from state treasurer from the 15th of Feb. to the 31st of October, 1839,		$80,000 00
Balance,		$7,055 14

STATEMENT No. 4.

Showing the number of cords, price per cord, and the amount paid for wood purchased for locomotives, &c.

From whom purchased.	No. of cords	Price per cord.	Amount.
Michael Dunnigan,	63	$1 12½	$70 87½
Daniel O. S. Kelly,	100	1 12½	112 50
George Murray,	7	1 12½	7 87½
James Patterson,	19	1 25	23 75
Michael Bracken,	67	1 12½	75 37½
William Callin,	20	1 12½	22 50
William Porter,	83	1 12½	93 37½
David Bibblet,	10½	1 25	13 12½
John Farrens,	291	1 12½	327 37½
Rosanna M'Glaughlin,	62	1 12½	69 75
Raphael Cooper,	182	1 12½	204 75
C. B. Kennedy,	105	1 12½	118 12½
Christiana Durno,	115½	1 25	144 37½
Daniel Sherbine,	6	1 12½	6 75
Jane L. Buckman,	42	1 25	52 50
John Wilt, & Co.	60	1 37½	82 50
Jacob Burgoyn,	61½	1 00	61 50
Edward Donaldson,	49	1 12½	55 12½

From whom purchased.	No. of cords	Price per cord.	Amount.
John Kean,	25	1 12½	28 12½
John M'Gough,	75	1 12½	84 37½
do	233	1 18¾	276 68¾
Henry Sharp,	59	1 12½	66 37½
Edward Burk,	22½	1 00	22 50
do	20	87½	17 50
John Noel,	100	1 12½	112 50
Daniel Wilt,	68	1 25	85 00
Sarah A. Stiner,	66	1 12½	74 25
Barnes & Crum,	130	1 12½	146 25
John Hagan,	30	1 00	30 00
James Weakland,	20½	87½	17 93¾
Peter Livergood,	140	1 25	175 00
Total cost of wood,			$2,678 62½

STATEMENT No. 5.

Showing the amount of Oil and Tar, used upon the road this season.

	No. of Gallons.		Price.	Remarks.	Amount.
James Steel, & Co.	446	sperm oil	$1 25	best qua'ty	$557 50
do	63	olive oil	1 30	do	83 79
do	600	sperm oil	1 30	do	780 00
Smith & Guthrie,	68	do	1 40	do	95 20
Brown & Leet,	535	do	1 23	do	658 05
J. C. Betts, & Co.	11½	do	1 56¼	do	17 97
C. F. Parker,	24	do	1 50	do	36 00
do	3	do	1 62½	do	4 87½
James Steel, & Co.	50	barrels tar	2 62½	per barrel	131 25
do	40	do	2 87½	do	115 00
Drayage &c., on the above oil and tar,					25 56
Total cost of oil and tar,					$2,505 19½

STATEMENT No. 6.

Names.	Items.	Amount.
Mathew, Welch, & Kennedy,	for castings &c. for depot,	$2,670 14
Mulhollan & Waterman,	iron, do	159 24
Royer & M'Lanahan,	do do	128 06
John Bollinger,	amount of his bill of sundries,	27 54
Smith & Guthrie,	small ropes,	141 41
Henry Fox,	Smith work &c.	4 00
Bernard O. Friel,	do and castings,	13 14
Daniel Brown,	do	4 14¾
John Sheridan,	do	174 17½
Thomas M'Connell,	do	20 31¼
John Kean,	lumber,	78 02
Edward Burk,	do	86 00½

Names.	Items.	Amount.
Edward Donaldson,	sundries,	5 01
Linton & Chamberlain,	do	5 50
George W. Kern,	sundries	22 16
Brown & Leet,	do	334 48
S. & T. B. Moore,	do	144 89
Robert Corker,	sundries,	14 25
Jacob Frenheiser,	do	72 43
Thomas Frame,	do	4 12
J. F. & R. G. Garrard,	do	45 50
Adam Fockler,	do	97 25
John H. Conner,	for painting,	14 00
Monahan & Power,	harness,	11 48
Emanuel Shaffer,	building, repairing and painting, motive power cars,	478 00
George Hill,	freight on iron &c.	37 08
Union Line,	freight on R.Road ropes &c	163 32
J. W. M'Cord,	leather and hose for locomotives,	8 94
Alex. Ennis,	freight on 40 bbls tar from Philadelphia,	124 50
Hugh Peach.	tallow,	62
Sarah Porter,	do	3 11
Daniel Staley,	do	274 32
M'Farland & Garber,	castings &c,	41 08
John Ivory,	sundries,	46 08
John Crouse,	smith work,	9 25
Joseph Johnson,	tallow,	89 88
William Pringle,	ash plank,	21 30
A. Marbourg,	sundries,	63 66
Jacob Snyder,	do	11 04
John White & Co.	freight,	50 30
Hugh Dugan,	sundries,	24 11
Royer & M'Lanahan,	freight,	116 88
John Mathews,	hauling ropes on planes,	30 00
Brown & Leet,	2000 lbs spring steel,	220 00
Jacob Horner,	3 days work of 1 horse at 75 cents,	2 25
Jas Stewart,	8 days work of 1 horse at 75 cents,	6 00
	stationary,	35 35
	printing,	94 50
	postage,	31 15
Andrew Bradley,	coal furnished at Johnst'n.	36 43
Edward Donaldson,	do do various places	529 03
James M'Ghee,	do do Johnst'n depot,	72 12
	Total amount of miscellaneous items,	$6,0

STATEMENT No. 7, LOCOMOTIVES.

Names of Engines.	Class.	Names of Makers.	When commenced running.	First cost.	Present state.	Days' of service.	State of the Engines took charge of the road.
Bush Hill,	1	William Norris.	April 17, 1837,	$7,500	under repairs,	183	in good order.
George Washington,	3	do	July 13, 1836,	6,300	in service,	160	do
Independence,	1	do	July 4, 1837,	7,500	do	222	do
Benjamin Franklin,	3	do	Aug. 19, 1836,	6,300	used as a reserve,	41	in very bad order.
Robert Morris,	3	do	May 12, 1836,	6,300	in service,	195	in running order.
James Madison,	2	do	March 21, 1837,	6,950	do	212	do
La Fayette,	3	do	March 21, 1837,	6,500	do	210	do
United States,	1	do	May 22, 1837,	7,500	do	211	do
Constitution,	1	do	June 12, 1837,	7,500	do	222	do
Mountaineer,	2	M'Clurg, Wade, &c.	March 29, 1837,	6,250	under repair,		required rebuilding.
Pennsylvania,	2	do	not known.	4,000	used as a reserve,	75	do
Pittsburg,	3	do	Sept. 3, 1835,	4,500	in service,	205	in very bad order.
Back Woodsman,	2	do	Nov. 18, 1836,	6,250	do	225	do
Allegheny,	2	E. A. G. Young.	May 10, 1835,	5,700	under repairs,		required rebuilding.
Tennessee,	2	do	May 10, 1835,	5,700	used as a reserve,	45	do
Comet,	2	do	July 16, 1836,	6,500	in service,	173	in very bad order.
Boston,	3	R. M. Houton.	May 10, 1835,	8,000	used as a reserve,	15	do

[No. 9.]

Report of Wm. K. Huffnagle, Engineer Columbia Rail Road.

EASTERN DIVISION.

There are ample grounds for congratulation, in the excellent condition in which this division has continued throughout the season. Too much praise cannot be given to the unwearied vigilance of the supervisors, in anticipating and preventing breaches. But few have occurred, and those have been repaired without impeding the navigation.

This division is forty-two and eighty-five hundredth miles in length, extending from the junction of the Susquehanna and Juniata divisions, to the canal basin at Columbia. The number of the lift locks in the main line, is fourteen, not including the guard locks, and lock into of the Union canal, and the outlet locks at Middletown and Columbia. There are in addition, three locks from the pool of Clark's ferry dam to the junction of the Eastern Susquehanna and Juniata divisions on Duncan's island. The whole lockage between the Columbia basin and the pool of Clark's ferry dam, is ninety-four and a half feet.

There is much inconvenience experienced on the level between locks No. 1 and 2, on Duncan's island, for want of a waste river. Materials were provided and a site selected for one, in 1835 but it was abandoned by a subsequent engineer, and the mater[illegible]s used for a different purpose. It will be nessary to provide them an[illegible]w, which will be done and the weir inserted during the ensuing [illegible]ter, upon an improved plan.

The Clark's ferry dam was slightly inj[illegible] the ice fr[illegible]het of last spring. The sluice wall was carried a[illegible] the water's edge and the cribbing of the dam received some inju[illegible]. A portion of the anchor wall was also destroyed. These ha[illegible] been restored in the most substantial and permanent manner, by the supervisors. A similar result could now scarcely occur.

The sluice for the river navigation th[illegible]gh the dam is much deeper than is necessary. It appeared to be six or seven feet deep, when the water was at an unusually low pitch in the summer. This renders the feeding of the canal in low stages of water very difficult. It is proposed to fill up the sluice at least three feet, which would secure a much more plentiful supply of water, at the same time, improving it for the purposes of navigation.

During the last administration an appropriation was made for the doubling of the guard locks and lift lock No. 1, on the main line. When the canal was put under my charge, the additional lower guard lock, and lock No. 1, were nearly completed. For the additional upper guard lock, the pit had been excavated, and the stone delivered.

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As the necessity for doubling a lock, which stands open nine-tenths

Names of Agents.	Duties.	NUMBER OF DAYS IN Feb'ry.	March.	April.	May.	June.	July.	August	Sept.	Oct.	Night work.	Total number of days	Pay per diem.	Amount paid each.	Aggregate.
WOOD SHED AT HALF WAY HOUSE.															
Joseph Burgoon,	Foreman		30½									30½	$1 12½	34 31¼	
do	do			30	28	29½	30	29	30	31	3½	211½	1 37½	290 46¾	
William Burgoon,	Laborer		31	17	26	14						88	1 00	88 00	
John C. Burgoon,	do			25	27	27½	6			26½		112	1 00	112 00	
Abraham Shoup,	do			23	26	24½	26	25	26	25		175½	1 00	175 76	
Jacob Burgoon,	do			29	28	27						84	75	63 00	
															$783 53—Cost of wood shed a Half Way House.
WOOD SHED AT PLANE No. 2.															
Samuel Dillon,	Foreman	4	31	30	31	30	31	29	27	30½	5½	249½	1 37½	342 71	
John Warner,	Laborer	4	30	26	20½	28	28	25½			8½	171½	1 00	171 60	
Timothy McAlamney,	do		30	26	27½	27	29	28	27	25	5½	223	1 00	223 00	
Henry Allenbaugh,	do		29	27	28½	26	27	25½	26½	28	8½	209½	1 00	209 76	
Timothy O. Keefe,	do		23	30	31	30	30½	29	29½	27½	8½	237	1 00	237 00	
Patrick Reilly,	do		11½	24	24½	27				16	5½	108½	1 00	108 60	
															$1,292 46—Cost of wood shed No. 2.
WOOD SHED AT PLANE No. 4.															
John Mathews,	Foreman		11	30	31	30	30	30	30	31		223	1 37½	306 62½	
William Lattimer,	Laborer	4	25	28	27	20	26	24	22	28		200	1 00	200 00	
William Porter,	do		22	27	24½	21	23	22	23½	23½		186½	1 00	186 60	
John Mathews,	Foreman										13	13	75	9 75	
															$702 87½—Cost of wood shed at No. 4.
WOOD SHED AT No. 9.															
Robert G. Mason,	Foreman			28	31	30	31	31	30			181	1 37½	248 67½	
Stephen Kerns,	Laborer				20½	20½	20½	26½	22½			108½	1 00	108 25	
Francis McKee,	do		13	8½								19½	1 00	19 50	
Edward Burk,	do			7	21	18½	15½		18½			80½	1 00	80 25	
do	do		For sawing 77 cords of wood, @ 75 cts. per cord.											57 75	
															$514 82½—Cost of wood shed at No. 9.
WOOD SHED AT PLANE No. 10.															
Archibald Galbraith,	Foreman		11	30	31	25	30	31	30	31		319	1 37½	301 12½	
Samuel Galbraith,	Laborer		9	26	27	25	26	27	25	27		192	75	144 00	
Barnabas Farrel,	do			8	27	21½	23½	27	25	26		158	1 00	158 00	
Nicholas Goshorn,	do									26½		26½	87½	22 31¼	
															$625 43¾—Cost of wood shed at No. 10.
SWITCH AND WATER STATION TENDERS.															
John Devlin,	Switch tender at the foot of No. 1.		13½	30	31							74½	1 00	74 50	
Michael Bracken,	Switch tender and wood sawyer at large viaduct.		5	24	26	25	28½	21	22	21		172½	1 00	172 60	
Samuel Cole,	Switch tender at Jefferson,		7	30	31	30	31	31	30	31		221	87½	193 37½	
Augustine M'Dermit,	do do Hollidaysburg,			28½	31	30	31	31	30	31		212½	1 00	214 60	
															$862 87½—Cost of switch tenders.
HOLLIDAYSBURG DEPOT.															
Isaiah W. Bucker,	Blacksmith,	7	28		28½	25½	26	24½	24	26½		217	1 50	325 50	
William Casey,	Blower and striker	6	28		28½	26	26	26	25	25½		217½	1 12½	244 68½	
Thomas Duke,	Finisher				20	26						55	1 50	83 50	
Same,	do						28	30	25	26		109	1 62½	177 12½	
															$829 81½—Cost of Hollidaysburg depot.
SUPERINTENDENTS, CLERKS, STATE AGENTS, &c.															
John Scodgrass,	Superintendent motive power											258	4 00	1,032 00	
Joseph Purse,	Assistant Superintendent motive power	11	31	30	31	30	31	31	30	31		256	2 80	640 00	
John Ferguson,	do do do	11	31	30	31	30	31	27	30	31		262	2 50	630 00	
John W. Geary,	Clerk,			19	31	30	31	31	30	31		203	2 00	408 00	
Linton Rogers,	Superintendent machinery	11	31	30	31	30	31	31	30	31		258	3 50	903 00	
Rogers Marshall,	State agent		12	30	31	30	31	31	30	31		226	2 00	452 00	
Rudolph Williams,	do			29	31	30	31	31	30	31		213	2 00	426 60	
															$4,482 00—Cost of Superintendents, &c.

A STATEMEN

r Horse Power i

	June.	Aggregate.
Henry	$84 60	
Henry	109 89	
Jacob ¼	53 73	
Geor	249 35½	
Henr ½	412 42½	
Uller	48 60	
Will ¼	68 62½	
Jame ¾	391 85	
R. H ¼	66 96	
	180 46¾	
Henr ½	304 11½	
Uller ¾	69 99¾	
Jam	41 62½	
R. I	87 18¾	

—Cost of horse power

STATEME

gines in each

MBER OF BU		
June	per bushel.	Amount.
4,532¼	4	$1,518 85
6,808	4½	1,511 10
6,440	4⅓	2,303 14¼
368	4½	347 76
	7	46 37½
		5,727 23
	cent. retained	572 72
	for coal,	
		$5,154 51

STATEMENT No. 2.

Showing the amount paid on each Contract for Horse Power in each month, and the total amount paid each Contractor:

Contractors names.	Place.	March.	April.	May.	June.	July.	August.	September.	October.	Amount paid each.	Aggregate.
Henry McKinzie,	Foot of plane 1.	$93 93¾	$92 47½	$123 56	$84 60	$89 25⅝	$89 25⅝	$77 06¼	$80 31	$676 46	
Henry Sutton,	Tunnel.	51 28	179 82	195 14	109 89	115 88¼	115 21⅜	109 89	115 88¼	993 00⅜	
Jacob Glass,	Foot of plane 2.	23 28¼	100 30	118 78¼	53 73	48 35⅜	48 35¼	44 77½	48 36	485 94¼	
George W. Johnson,	Between planes 2 and 3.	80 07½	516 85½	405 73	249 35½	236 50¼	201 16	265 10¼	223 27½	2,178 01½	
Henry McBride,	Between planes 3 and 4.	115 93	705 24½	573 55½	412 42½	432 69½	394 43⅜	432 60⅜	356 91½	3,482 80	
Ullery & Matthews,	Head of plane 4.	17 82	48 60	69 66	48 60	43 74	43 74	40 50	43 74	355 40	
William Henry,	Foot of plane 5.	18 56¼	50 62½	52 31½	68 62½	45 56½	45 56¼	42 18⅜	45 56¼	369 00	
James Moorhead,	Between planes 5 and 6.	105 60¼	632 09½	595 58⅜	391 85	379 10½	345 63½	380 04⅜	344 87½	3,175 19½	
R. Humphries,	do do 6 and 7.	22 32	66 96	69 19½	66 96	69 19½	69 19½	66 96	69 19½	499 97	
Same,	do do 7 and 8.	47 20	302 86½	275 40	180 46⅜	186 69½	172 47½	185 33	164 16	1,514 59	
Henry Brown,	do do 8 and 9.	78 18½	506 04⅞	452 46¼	304 11⅜	314 64½	295 79⅜	311 34⅝	275 74¼	2,538 31⅜	
Ullery & Matthews,	Foot of plane 9.	16 47	49 41	51 05⅞	69 99⅜	51 05⅜	51 05⅜	44 47	44 47	377 99	
James Scullin,	Head of plane 10.	14 98½	61 88	49 95	41 62½	49 69	44 96	41 62½	44 95½	344 84	
R. Humphries,	Foot of plane 10.	30 18⅜	90 67	94 16½	87 18⅜	94 16½	94 16½	87 18⅞	94 16½	672 19¾	
											$17,664 84½—Cost of horse power

STATEMENT No. 3.

Showing the amount of coal used at the Stationary Engines in each month, the amount during the season, and the cost of the same.

Contractors names.	Number of Planes furnished.	NUMBER OF BUSHELS IN March.	April.	May.	June	July.	August.	September.	October.	Total number of bushels.	Price per bushel.	Amount.
Henry Fox,	No. 1, 2, and 3,		8,047½	5,272½	4,532½	5,642½	5,920	4,902½	3,653¾	37,971½	4	$1,518 86
Samuel Lemon,	No. 6, 7, and 8,		4,140	4,508	6,808	736	6,808	4,876	5,704	33,580	4½	1,511 10
Kemp & Cunningham,	No. 4, 5, 9, and 10,		11,132	6,624	6,440	6,745	3,772	6,256	10,212	51,181	4½	2,303 14½
Same,	No. 6, 7, and 8,		7,084	276	368					7,728	4½	347 76
	Lump coal for locomotives,									62½	7	46 37½
												5,727 23
										Deduct 10 per cent. retained		572 72
										Amount paid for coal,		$5,154 51

Art. 1. CONTINUED.

pt.	Night work.	Total of
31	13	
31	5½	
	7	
21		

Names of agents	Duties.	NUMBER OF DAYS IN Feb'ry.	March.	April.	May.	June.	July.	August	Sept.	Oct.	Night work.	Total number of days,	Pay per diem.	Amount paid each.	Aggregate.
LEVEL BETWEEN No. 9 and 10															
David Bently,	Locomotive runner.		29	30	31	30	31	31	30	31	13	256	$2 00	512 00	
John Quayle,	do			13	31	30	30	31	30	31	5½	201½	2 00	403 00	
James Morgan,	Locomotive fireman,	11	30	30								71	1 00	71 00	
Lewis Miller,	do			30							7	37	1 12½	41 62½	
Eli Yoder,	do				18	30	31	31	30	31		171	1 12½	192 37½	
Francis McKee,	do				27	30	31	31	30	31	2	182	1 12½	204 75	
Mathew Hook,	do		12½	30							11	53¾	1 12½	60 18¾	
															$1,484 93½—Cost of level between 9 and 10
HOLLIDAYSBURGH LEVEL.															
Barnabas M'Coonell,	Locomotive runner	11	31	30	31	30	31	29	30	30	15	268	2 00	536 00	
Patrick Smith,	do	11	31	30	31	30	31	31	30	30	15	271	2 00	542 00	
James Patterson,	Locomotive fireman		21	30	31	30	23				15	150	1 12½	168 75	
Patrick Murphy,	do	1	31	30	31	30	31	31	30	31	15	201	1 12½	293 62½	
Patrick Regan,	do						14	31	30	31		106	1 12½	119 25	
															$1,659 62½—Cost of Hollidaysburg level.
RIGGER'S LOFT.															
John Black,	Foreman	9	31	30	31	29	29½	30¾	28	28½		246¾	1 75	431 81¼	
Mathew Black,	Rigger	7½	27	28	28	26½	27½	30¾	25	27		227½	1 25	284 06¼	
James Kelly,	do	7	29	27½	27	27½	29½	31	26½	27½		232	1 25	290 00	
Maurice Reily,	do		17	30	24½	25¾	24½	25	24½	18¾		189½	1 25	236 87½	
Michael Storm,	do		8¾	29	27	27	27¼	31	25½	25		200	1 25	250 00	
Arthur Runey,	do		18									18	1 25	22 50	
Patrick Regan,	do		10¼			2¼						12¾	1 25	15 93¾	
															$1,531 18¾—Cost of riggers loft.
SUMMIT SMITH SHOP.															
Jacob Holder,	Blacksmith	10	30	5								45	1 50	67 50	
David Martin,	do			22	27	25	25¼	27	26	25		177½	1 50	265 87½	
John Brown,	Blower and striker		20									20	1 12½	22 50	
James M'Glaughlin,	do		20	22	27	25	25¾	27½	24¾	25		196¼	1 12½	221 06¼	
Charles Murry,	Carpenter			20	19	16	17¼	15½		22		110	1 37½	151 25	
Hugh M'Closkey,	do			19½								19½	1 25	24 37½	
															$752 56½—Cost of Summit smith shop.
REPAIRING STA'RY. ENGINE.															
John Cohick,	Repairing				29	29¼	26					84¼	1 62½	136 90½	
James Fleming,	do								24			24	1 75	42 00	
Thoms Duke,	do		10	31	30							71	1 50	106 50	
David E. Sisett,	do				11							11	1 50	16 50	
Joseph Christie,	do		18	20	9½							47¼	1 25	59 06¼	
Michael Dougherty,	do	6	30	29								70	1 25	87 50	
Do	do				26						5	20	1 37½	35 75	
Jonathan Fittle,	do				19½							19½	1 25	24 37½	
John Quaile	do		27	10								53	1 50	79 50	
Edward Gordon,	do						27½					27½	1 50	41 25	
John Cohick,	do							26	25	8¾		59¾	1 50	89 62½	
															$718 96¾—Cost of repairing stationary engine
CAR CONDUCTORS.															
William Campbell,	Car Conductor		14									14	1 00	14 00	
Peter Mock,	do					29	31		14	31		105	1 12½	118 12½	
James Murphy,	do					12						12	1 12½	13 50	
John Wonders,	do				20½	30	30½	31	30	5½		147½	1 12½	165 93¾	
Mark McGlaughlin,	do		17	30	31	30	30	31	30	31	10	240	1 12½	270 00	
															$581 56¼—Cost of Car Conductors.
WOOD SHED AT JOHNSTOWN.															
Jacob Horner,	Foreman		27	30	29½	29	28½	27	29	30		230	1 37½	316 25	
Peter Kinney,	Laborer		11	25	27	25	27	27	25	10¼	6	183¼	1 00	183 25	
Adam Horner,	do		11	24	20½	16					5½	83	1 00	83 00	
Samuel Horner,	do		12	26	25	25	27	27	25	25	6	198	1 00	198 00	
Jackson Horner,	do		11	26	27	25	10	24	25	27		175	75	131 25	
															$911 75—Cost of wood shed at Johnstown.
WOOD SHED AT PLANE No. 1.															
M. W. Dickey,	Foreman	2	31									33	1 12½	37 12½	
Do	do			30	31	30	31	30	30	31	6	219	1 25	273 75	
M. M'Cullough,	Laborer		9½									9½	1 00	9 50	
Henry Stewart,	do		22½	30	28							80½	75	60 37½	
Same	do					25	27	25	21¼	26		124¾	87½	108 71	
Same	do								3		6¼	6¾	37½	2 34¼	
Michael Stewart,	do		11¼									14¼	50	7 25	
James Galbraith,	do		17½	30	5						4½	50¾	1 00	56 75	
Samuel Galbraith,	do		17½	30	26	18½					4½	96½	1 00	96 50	
George Shaffer,	do		16	30	28	23½	27	25	26	24	1	203¾	1 00	203 25	
John Shaffer	do		16	25½	2						2¾	46¾	1 00	56 25	
John Blair,	do				25	25½	7	27½		24½	¼	109¾	1 00	109 75	
															$1,011 55¼—Cost of wood shed at No. 1.

Those E

facturers on trial.

Names of Agents.	Duties.	NUMBER OF DAYS IN Feb'ry.	March.	April.	May.	June.	July.	Aug'st.	Sept.	Octob'r	Night work.	Total number of days.	Pay per diem.	Amount paid each.	Aggregate.
PLENE No. 8.															
William Arbel,	Engineer		31	30	31	30	31	31	30	31	11	256	$1 75	448 00	
Henry Arbel,	Assistant Engineer		3	30	31	29	31	31	30	31	11	227	1 25	283 75	
C. K. M'Closkey,	Fireman		13	30	31	30	31	31	30	31	11	238	1 12½	267 75	
Thomas M'Closkey,	Hicher		8	30	31	30	8				11	118	1 00	118 00	
Thomas Daily,	do		7	30	31	4					11	83	1 00	83 00	
Lewis Miller,	do								25	31		56	1 00	56 00	
John M'Cormick,	do		12	30	31	30	31	31	30	31	11	237	1 00	237 00	
John Dougherty,	do		28	30	31	30	31	31	30	31	11	253	1 00	253 00	
John Flick,	do		7	30	12						11	60	1 00	60 00	
															$1,806 50—Cost of plane No. 8.
PLANE No. 9															
John Lovett, Sen.	Engineer	11	31	30	31	30	31	31	30	31	12	268	1 75	469 00	
William Lovett,	Assistant Engineer		13	30	31	30	31	31	30	31	12	239	1 25	298 75	
Adam Haine,	Fireman		12	30	14						12	68	1 12½	76 50	
Michael Fluck,	do				17	30	31	31	30	31		170	1 12½	191 25	
Jacob Wire,	Hicher		22									22	1 00	22 00	
Christian Whisler,	do		20	30	31	30	31	31	30	31	12	246	1 00	246 00	
John Shadle,	do		13	30	31	30	31	31	30	31	12	239	1 00	239 00	
Michael Fluck,	do		6	30	14						12	62	1 00	62 00	
William Leighty,	do			29	31						12	72	1 00	72 00	
Aaron Lovett,	do			26	30	30	8		29	31	10¼	164½	1 00	164 50	
															$1,841 00—Cost of plane No. 9.
PLANE No. 10.															
James Bowstead,	Engineer	10	31	30	31	30	31	31	30	31	13	268	1 75	469 00	
Thomas Fluck,	Assistant Engineer		13½	30	31	30	31	31	30	31	13	240½	1 25	300 62½	
James Mahan,	Fireman		14	30	31	30	31	31	30	31	13	241	1 12½	271 12½	
Levi Dasher,	Hicher		13	30	31	30	9				13	126	1 00	126 00	
James Keech,	do			25							11	36	1 00	36 00	
Thomas Farrell,	do		11	30	31	30	31	31	30	31	13	238	1 00	238 00	
James McKee,	do		9	30	31	30	31	31	30	31	13	236	1 00	236 00	
Abraham Robinson,	do		30									30	1 00	30 00	
Joseph Wharton,	do			29½	31						13	73½	1 00	73 50	
Eli Yoder,	do				13						2	15	1 00	15 00	
Philip Davis,	do								26	31		57	1 00	57 00	
															$1,852 25—Cost of plane No. 10.
JOHNSTOWN LEVEL.															
George P. Harris,	Locomotive runner	5	31									36	1 75	63 00	
do	do			30	31	29	30½	31	30	30¾	10½	222¾	2 00	445 50	
Joseph Parkes,	do	6	31									37	1 25	46 25	
do	do			30	31	28	31	31	30	31	8½	220½	2 00	441 00	
John Kennedy,	Locomotive fireman		14	30	31	30	7				10½	122½	1 12½	137 81¼	
James Bradley,	do						15	31				46	1 12½	51 75	
Isaac Wike,	do								28	30¾		58¾	1 12½	66 09	
Francis Devlin,	do		19	30	31	26½	31	31	30	31	8½	238	1 12½	267 75	
															$1,519 15¼—Cost of Johnstown level.
LONG LEVEL.															
Barnabas Collier,	Locomotive runner	8½	31	30	29	30	27	30	25	30	10	251¼	2 00	503 00	
John Wagner,	do		19	30	31	30	31	31	30	31	10	242	2 00	484 00	
Samuel McClaren,	do	8	31	30	29						11	109	2 00	218 00	
John Smith,	do			12	31	30	22½				9	104½	2 00	208 50	
James Patterson,	do						8	31	30	31		100	2 00	200 00	
James Russel,	Locomotive fireman		14¾	30	31	30	27½	31	29	30	10	232¾	1 12½	261 84¼	
Cornelius Dugan,	do		11½	30	31	30	31	3½			9	146	1 12½	164 25	
Joseph Neff,	do		2	30	31	30	29½	31	30	31	6	220½	1 12½	248 06¼	
Jonathan Fittle,	do		17	30							10	57	1 12½	64 12½	
John Shaffer,	do				23	30	10	31	17½	31		142½	1 12½	160 31¼	
Robert G. Mason,	do		11									11	1 12½	12 37½	
James Stewart,	do							6¾				6¾	1 12½	6 59¾	
															$2,531 06—Cost of Long level.
LEVEL BETWEEN No. 4 and 5.															
Patrick Donahue,	Locomotive runner	10	31	30								71	1 75	124 25	
Same,	do				12						12	24	2 00	48 00	
David E. Bisett,	do			19	30						7¼	56¼	2 00	113 00	
Thomas Porter,	do					30	31	31	30	30		152	2 00	304 00	
John Lovett, Jr.	do			14		24	31	31	30	31		161	2 00	322 00	
Thomas Porter,	Locomotive fireman		6½	30	30						11¼	73	1 12½	87 75	
Charles Conway,	do					30	20	30	30	30		149	1 12½	167 62½	
James Downey,	do		5	30	12						12	59	1 12½	66 37½	
Charles Flick,	do				15½	30	31	31	30	31		168½	1 12½	189 56¾	
Mathew Hook,	Locomotive runner				18	0						24	2 00	48 00	
															$1,470 56¼—Cost of level between 4 and 5.

ENT No. 1

1

Power Age

r, 1839.

Those E

facturers on trial.

Showing the names, time of service, daily pay, and amount paid each, of the Motive Power Agents, on the road during the year, from 15th February to 31st October, 1839.

Names of agents	Duties.	NUMBER OF DAYS IN Feb'ry.	March.	April.	May.	June.	July.	August	Sept.	Oct.	Nigot work.	Total number of days,	Pay per diem.	Amount paid each.	Aggregate.
JOHNSTOWN DEPOT.															
Joseph G Bridges,	Foreman	8	31	30	31	30	30¼	28	30	20		238¼	$2 50	595 62½	
Thomas McBride,	Finisher		29	28½	25	21½	18½					125¼	1 75	219 18¾	
James Barrea,	do	6½	31	24	20	23¾	27	25	23¾	24¼		205	1 50	307 50	
John Dempsey,	do	5½	31	24½	20							81	1 25	101 25	
Same,	do					26	25¼					51¼	1 37½	70 47	
Same,	do							27⅞	25½	25¼		78½	1 50	117 75	
John Lovett, Jr.	do		25¼	10	23¼							58⅜	1 50	88 12½	
John Pringle,	do		5									5	1 25	6 25	
Same,	do			21½	27	27½	23½					99	1 37½	136 46⅜	
Same	do							26	25	24¼		75¼	1 50	112 87½	
Joseph Ward,	do		6¼	29	28	2						65¼	1 50	97 87½	
James Smith,	do							4				4	1 50	6 00	
James Fleming,	do							0		21½		30½	1 75	53 37½	
Joshua Scarff,	do							5	18⅜			23¾	1 50	35 62½	
John Fittle,	Pattern maker		20½	23½	24½	21	23	26½	23	23		184½	1 75	323 31¾	
B C Boyes,	do	10	22⅜	21	10¼							61	1 75	112 00	
Andrew Lockhart,	do		25¼	27½	27	25	26	26⅜	24	24½		205⅜	1 75	360 06½	
John Crouse,	Blacksmith		20⅞	30	26	24	19⅜	28	25	26½		209	2 00	400 00	
John Cahick,	do			7⅜								7½	1 50	11 62½	
Thomas Callahan,	Striker		17½	30	27	25	26½	28	24			178	1 25	222 50	
John Harker,	Blacksmith		28									28	1 25	35 00	
John Horner,	Engineer of depot		29	28½	23	26½	21					131	1 25	163 75	
Charles Stewart,	do							26½	25			51¼	1 25	61 06¼	
James Collins,	Laborer		13½	26½	26⅜	21	25⅜	21½	25			159⅜	1 00	159 75	
James Bradley,	do		12½	26⅜	26¼		25		22¾	24½		139¼	1 00	139 25	
Robert McBride,	do					16	25⅞					41⅞	1 00	41 75	
															$3,981 43¾ Cost of Johnstown depot.
PLANE No. 1.															
John Bougher,	Engineer		28	30	31	30	23½	30½	30	31	11	245	1 75	428 75	
Gibson Trimble,	Assistant engineer		18½									18½	1 25	23 12½	
John M'Clure,	do		9	30	31	28	31	30	30	31	10⅜	230⅜	1 25	288 43⅞	
C R Baughman,	Fireman		16	30	31	29	31	31	19		11	198	1 12½	222 75	
Archibald M'Clellan,	Hitcher		20½	30	31	30	31	31	30	31	10⅜	245½	1 00	245 25	
Jonas Horner,	do		18	30	31	4⅝					10½	93⅜	1 00	93 75	
John Fox,	do			30	31	30	31	10			10⅜	142⅜	1 00	142 75	
Peter Mock,	do		27½								6½	33½	1 00	33 75	
Andrew M'Clellan,	do				31	30	31	30½	30	31	2	185½	1 00	185 75	
Stewart M'Clellan,	do					4						4	1 00	4 00	
John Fox,	Fireman								11	31		42	1 12½	47 25	
															$1,715 56¼ Cost of plane No. 1.
PLANE No. 2.															
A H Graham,	Engineer	22	12									34	1 75	59 50	
Samuel M Cleery,	do		31	30	27						11⅜	99½	1 75	174 56¼	
John Lovett, Jr.	do				4	5					1	10	1 75	17 50	
David E Bisett,	do					25	31	31	30	31		148	1 75	259 00	
Patrick Donahoo,	Assistant engineer		29½	15							5½	49½	1 12½	55 68¾	
James Foster,	do			10⅜	31	30	31	31	30	31	5½	200	1 25	250 31¼	
James A M'Gough,	Fireman		23	30	31	29	14½	20½	12½		11½	171½	1 12½	192 93¾	
James Conway,	do								17⅝	31		48⅝	1 12½	54 84¼	
Andrew Dunlap,	Hitcher	26	4									30	87½	26 25	
Francis O Neil,	do		27	30	31	30	31	31	30	31	11½	272¼	1 00	252 25	
Francis M'Connell,	do		10½	13⅜								24	1 00	24 00	
Peter O Neil,	do		3	29							8½	40½	1 00	40 25	
Timothy M'Atamney,	do			6							⅜	6⅜	1 00	6 25	
E C Thompson,	do			30	30½	11¼					11½	83	1 00	83 00	
William Campbell,	do			26	30½	29⅜	31	31	30	31	10½	219½	1 00	219 50	
E C Thompson,	Fireman						16½	8½				25	1 12½	28 12½	
Peter Mock,	Hitcher				31						2	33	1 00	33 00	
															$1,776 97½ Cost of plane No. 2.
PLANE No. 3.															
William M'Connell,	Engineer	11	31	30	31	30	31	31	30	31	12	268	1 75	469 00	
James Dearmitt,	Assistant engineer	4	31	30	31	30	31	30	30	31	12	260	1 25	325 00	
William Fox,	Fireman		20	30	30	29½	30½				12	151⅜	1 12½	170 71½	
William S. M'Coy,	do							30½	30	31		91½	1 12½	102 65½	
Thomas Moreland,	Hitcher		19	30	31	30	31	31	30	31	12	245	1 00	245 00	
William Daugherty,	do		15	30	31	30	31	31	30	31	12	241	1 00	241 00	
Patrick Regan,	do				22							22	1 00	22 00	
Daniel M'Connell,	do		9	30	10						12	55	1 00	55 00	

No 9

Those E

facturers on trial.

STATEMENT No. 1—Continued.

Names of Agents.	Duties.	NUMBER OF DAYS IN Feb'ry.	March.	April.	May.	June.	July.	Aug'st.	Sept.	Octob'r	Night work.	Total Number of days.	Pay per diem.	Amount paid each.	Aggregate.
PLANE No. 3—Continued.															
Frederick Speilman,	Hicher		17									17	$1 00	$17 00	
Philip Dyer,	do		2	30	30						12	74	1 00	74 00	
James Conway,	do					6½						6½	1 00	6 50	
Allen Sharp,	do						3					3	1 00	3 00	
															$1,730 87½—Cost of plane No. 3.
PLANE No. 4.															
James Downey,	Engineer	12										12	1 75	21 00	
William Webster,	do			30	31	30	31	31	30	31	13½	258½	1 75	452 37½	
John Glass,	Assistant Engineer		31									7	87½	6 12½	
Charles B Kenaedy,	do	7		30	31	30	31	31	30	31	13	258	1 25	322 50	
Thomas Ferron,	Fireman		31	30	31						12½	99	1 12½	111 37½	
James Ferron,	do		25½			30	31	31	30	31		153	1 12½	172 12½	
Hugh Peach,	Hicher,			30	31	30	31	31	30	31	12½	256½	1 00	256 50	
John M'Dermit,	do		30	30	31	30	31	31	30	31	12½	230½	1 00	230 50	
James Downey,	do		4									13	1 00	13 00	
Timothy M'Atameny,	do	7	13									7	87½	6 12½	
Joseph Christie,	do	12										12	87½	10 50	
Daniel Brown,	do			30								49	1 00	49 00	
John Brown,	do		19		31	11					12½	87½	1 00	57 50	
Thomas Carroll,	do				31							31	1 00	31 00	
James Murphy,	do					16	5					21	1 00	21 00	
John Kennedy,	do		6	30							12½	48½	1 00	48 50	
															$1,807 12½—Cost of plane No. 4.
PLANE No. 5.															
David E Bisset,	Engineer	3	31									34	1 50	51 00	
Gibson Trimble,	do		9	30	31	30	31	31	29	31	12½	294½	1 75	410 37½	
Philip Smith,	Assistant Engineer		31	30	31	30	31	25	30	31	12½	251½	1 25	314 37	
Cornelius Dougherty,	Fireman		17	30	31	30	31	31	30	31	12½	243½	1 12½	273 93¾	
Michael Dunnigan,	Hicher		17	30	31	30	31	31	30	31	12½	243½	1 00	243 50	
James M'Garity,	do		27	30	31	30	31	31	30	31	12½	253½	1 00	253 50	
Alexander Thompson,	do		11	30	31	20	9	5	15		12½	143½	1 00	143 50	
Owen Sweny,	do		5½									5½	1 00	5 50	
Michael Storm,	do		5									5	1 00	5 00	
John Christie,	do			18							7	25	1 00	25 00	
Patrick Foley,	do		23	30	10						12½	81½	1 00	81 50	
James Elder,	do		14									14	1 00	14 00	
Charles Conway,	do			11	31						4½	46½	1 00	46 50	
Samuel Thompson,	do								15	31		46	1 00	46 50	
															$1,913 68¾—Cost of plane No. 5.
PLANE No. 6.															
Richard Evans,	Engineer		31	30	31	30	31	31	30	31	15	260	1 75	455 00	
Richard Yeocom,	Assistant Engineer		5									5	1 25	6 25	
John M'Closkey,	do		18	30	30	30	31	31	30	31	15	246	1 25	307 50	
C Mehaffy,	Fireman		30	30	30	30	31	31	5		15	202	1 12½	227 25	
Edward Hughes,	do								25	31		56	1 12½	63 00	
Francis Rafferty,	Hicher		19	30	31	30	8		29	31	10½	194	1 00	194 00	
Edward Hughes,	do		27	30	26	5½					14	103	1 00	103 00	
David Power,	do		16	30	31	30	31	31	30	31	15	245	1 00	245 00	
Michael Smith,	do		17	30	31	30	31	31	8		15	193	1 00	193 00	
Charles Flick,	do		7	30	13						15	55	1 00	55 00	
C Mehaffy,	do								21	31		52	1 00	52 00	
															$1,901 00—Cost of plane No. 6.
PLANE No. 7.															
John M'Cafity,	Engineer	3	31	30	31	30	31	31	30	31	14½	262½	1 75	459 37½	
Patrick Farren,	Assistant Engineer		31	30	31	30	31	31	30	31	14½	259½	1 25	324 37½	
Bernard Murphy,	Fireman		30	30	30	30	31	31	30	31	14½	257½	1 12½	289 68¾	
John Stuyley,	Hicher		11	30	31	30	31	31	30	31	14½	238½	1 00	238 50	
Hugh Kernan,	do		27	30	31	30	13		29	31	14½	205½	1 00	205 50	
Henry Rifker,	do		14	30	31	30	31	30	30	31	14½	241½	1 00	241 50	
William Dyer,	do		7	30	12						14½	73½	1 00	63 50	
James Whalen,	do			23	22						7½	52½	1 00	52 50	
James Smith,	do			2								2	1 00	2 00	
Edward Burns,	do		5½	8								13½	1 00	13 5	
															$1,890 43¾—Cost of plane No. 7.

Exhibits

NT

Inclined Plane at Philade
st day of November 1839.

		June.		July.	
	ARS	TRIPS.	CARS.	TRIPS.	CAR
Octarara,					
Montgomery	157	16	230	16	28
Downingtow	387	15	160	8	17
Pequea,	354	16	227	12	22
Mississippi,	351	17	251	15	28
Parkesburg,	335	16	239	10	13
E. F. Gay,	162				
Wisconsin,	385	16	258	21	39
Indiana,	349			12	21
Conestoga,	40			7	13
Virginia,	370	11	155	11	18
Paoli,	3	28	184	28	19
Juniata,	9				
Ohio,	17	16	94	7	7
Brandywine,	10	3	18		
Delaware,	21	28	136	20	13
Schuylkill,	20	16	94		
Philadelphia,	5				
The Crab,	17				
Lancaster,	4	12	232	12	18
W. C. Farm	14	12	56	10	7
Westchester				4	2
Enterprise,					
G B. Porter		19	106	30	166
A. Jackson,		16	229	18	331
S. Cameron	35	14	182	7	155
Telegraph,	24	31	201	30	186
S. Snyder,	2	22	174	11	76
* Uncas,	9	1	10	3	29
* Mountain					
J. Buchana	6				
Kentucky,	7	15	118	19	261
* Hercules,	7	17	136	29	168
Edward B.					
Bald Eagle	7				
* Lady Lig	6	11	116	16	95
* Brooks,	6				
James Clar	8			1	9
Old Berks,					
	0	362	3606	357	4182

4 1
Those E

facturers on trial.

Exhibits the number of times the several Locomotive Engines arrived at, and departed from the Inclined Plane at Philadelphia, and the number of Cars drawn by them from the first day of November 1838, up to the first day of November 1839.

	November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.	
	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	17	221	Trips.	Cars	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars	Trips.	Cars.
Octarara,	20	353	11	202	2	45	9	172	24	435	19	384	10	157	16	230	16	280			12	210	12	192
Montgomery,	20	343	21	390	9	164	21	418	18	358	13	267	18	387	15	160	8	171	7	114	6	128		
Downingtown,	3	36	21	418	16	328	21	460	20	395	23	447	30	354	16	227	12	229	4	110	23	563	23	474
Pequea,	9	154	4	66			12	184	15	263	23	467	20	354	17	251	15	284	22	325	4	30	7	145
Mississippi,	20	310	7	55	15	282	18	317	12	204	13	215	26	335	16	239	10	131	9	157	8	167	22	390
Parkesburg,	18	287					1	8	17	310	6	105	11	169					4	92	21	386	13	226
E. F. Gay,	10	165	3	45	1	81	8	135	10	185	11	206	22	382	16	258	21	396	22	357	3	33	19	349
Wisconsin,	21	308	16	241	10	141	22	408	21	410	16	285	19	349			12	211	14	260	20	370	22	385
Indiana,	10	122	14	223	17	305	17	293	17	267	12	183	21	401			7	138	23	392	9	121	5	83
Conestego,	19	225									25	221	21	376	11	155	11	161	24	400	18	334	2	36
Virginia,	26	162	20	136	20	151			31	178	20	213	4	33	28	184	28	193	20	174	28	178	30	181
Paoli,	26	162	26	190	24	204			30	227	25	220	10	98							11	67	30	190
Juniata,	19	217	10	47	13	81			8	101	23	199	22	176	16	91	7	78						
Ohio,	17	172	22	230	12	154			20	194	15	85	11	101	3	18			4	36	1	9		
Brandywine,	24	135	17	70	20	83			28	218	10	72	27	210	28	136	26	132	6	38	5	38	18	126
Delaware,	12	109	18	149	18	107			19	185	9	98	24	202	16	94								
Schuylkill,	19	158	27	154	9	82			4	41	16	130	5	52										
Philadelphia,	30	162	22	189	23	242			11	126	9	119	22	170							7	60	30	108
The Crab,	6	114							7	136	21	167	4	43	12	232	12	186			5	104	6	85
Lancaster,	20	232	21	193	19				18	197			19	142	12	56	10	76	5	48	3	18		
W. C. Farmer,					2	16											4	23	19	70	29	212		
Westchester,					2	26																	13	107
Enterprise,									11	121	21	378			19	166	30	166	23	132	23	150	16	124
G. B. Porter,									22	473	19	461			16	229	18	331	19	462	23	335	16	279
A. Jackson,									12	281	27	214	19	355	14	182	7	152	5	67	20	408	19	329
S. Canceson,									12	189	12	134	30	240	31	201	36	186	3	18	10	66	7	61
Telegraph,									3	27	10	152	2	20	22	174	11	76	30	169	16	63		
S. Snyder,									3	25	15	125	21	394	1	10	3	29	19	196			14	159
* Pineas,									2	16	16	251												
* Mountaineer,											17	271	1	10										
J. Buchanan,											3	21	26	374	15	118	19	261	27	254	22	211	17	134
Kentucky,											2	46	8	57	17	136	29	168	4	19	5	35	15	119
* Hercules,											8	165												
Edward B. Hubley,													2	37										
Bald Eagle,													23	188	11	116	16	95	21	119	16	66		
* Lady Lightfoot,													4	26										
* Brooks,													16	338			1	9			9	151		
James Clarke,																			1		11	205	18	340
Old Berks,																			18	215	16	249		
	318	3927	283	2998	235	2669	129	2425	396	5604	474	5469	484	6440	362	3606	357	4182	352	4210	378	4930	374	4696

4 172 Trips.—51,156 Cars.—39 Engines.

These Engines in the above table marked thus * were not the property of the state, but were placed on the road by their manufacturers on trial.

Exhibits lined Plan
mber 1838,

		June.	
	s.	Trips.	C.
Conestoga,	8	10	
Brandywine	1	27	
Parkesburg	3		
Paoli,	3		
Virginia,	0	27	
Montgomer	8	14	
Indiana,	8	1	
Lancaster,	1	12	
Wisconsin,	5		
Octororo,	0	18	
Mississippi,	1	19	
Schuylkill,	0		
Philadelphia	4		
Ohio,	9		
Juniata,	6	13	
E. F. Gay,	9	17	
Pequea,	6	17	
Delaware,	3	16	
Downingtow	8	16	
W. C. Farme			
Westchester,			
Enterprise,		12	
General Jack	3	14	
S. Cameron,	5	28	
Telegraph,	2	21	
Geo. B. Port	4	17	
Simon Snyde	4	1	
Crab,	2	14	
James Bucha	5	14	
Edward B. H	2		
* Lady Light	9		
* Mountainee	4		
James Clark,	5		
Bald Eagle,	9	11	
Kentucky,	7	21	
Old Berks,			
* Brooks,			
* Hercules,			
* Uncas,			
	3	360	4

52,664

Those Engi facturers on

Exhibits the number of times the several Locomotive Engines arrived at, and departed from the Inclined Plane at Columbia, and the number of Cars drawn by them, including the Cars attached and detached at Dillerville, from the first day of November 1838, up to the first day of November 1839.

	November.		December.		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.	
	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars.	Trips.	Cars
Conestoga,	18	270									14	223	21	418	10	159	9	160	24	506	19	385	2	41
Brandywine,	22	109	13	81	22	66	15	57	27	231	14	41	27	181	27	209	23	129	6	39	3	18		
Parkesburg,	18	298	2	15	2	18			15	204	15	157	13	183					5	62	18	380	14	245
Paoli,	28	245	28	143	24	129	21	78	29	116	19	190	10	73							12	110	31	355
Virginia,	27	226	19	83	27	125	17	53	28	122	23	98	5	40	27	282	26	289	30	317	26	280	31	307
Montgomery,	20	348	20	356	11	221	18	321	15	286	17	291	19	308	14	236	8	125	7	53	6	112	6	80
Indiana,	9	154	15	99	15	201	17	186	15	223	17	308	21	418	1	4	6	105	21	433	6	108		
Lancaster,	19	232	11	102	20	94	13	87	18	180	20	120	17	141	12	68	7	65	7	42	3	18	22	460
Wisconsin,	21	335	17	215	8	102	20	281	21	302	13	210	18	395			11	223	15	332	21	372	12	155
Octororo,	20	314	12	173	5	66	13	174	24	344	21	311	12	240	18	388	17	340	1	15	13	215	23	465
Mississippi,	20	310	10	129	19	250	19	285	12	161	21	378	20	421	19	320	11	213	9	168	9	139		
Schuylkill,	21	185	23	144	10	62	21	166	5	50	10	84	12	100							8	65		
Philadelphia,	30	165	24	134	21	178	10	42	10	123	14	77	21	144										
Ohio,	18	170	23	236	13	150			19	155	26	189	14	178					4	11			18	325
Juniata,	21	241	11	101	9	45			7	66	22	182	22	156	13	99	10	85	1	4			8	154
E. F. Gay,	8	175	6	60	4	40	8	113	12	178	4	78	23	529	17	329	23	412	23	433	2	33		
Pequea,	10	158	9	97			10	161	16	227	24	460	19	366	17	320	18	324	24	376	5	82		
Delaware,	14	160	10	111	19	101	2	17	21	144	12	70	24	163	16	131							25	445
Downingtown,	1	22	21	336	17	275	21	371	20	331	12	219	20	388	10	316	12	272	1	81	20	388		
W. C. Farmer,					2	18											4	45	13	90	17	151		
Westchester,					4	35																	18	137
Enterprise,							1	28	8	60					12	107	28	139	24	173	10	164	21	302
General Jackson,									11	176	19	434	21	383	14	281	10	102	7	130	22	377	6	46
S. Cameron,									13	160	26	119	31	275	28	335	30	322	6	65	6	20		
Telegraph,									4	39	12	186	2	12	21	194	14	140	27	154	18	126	16	203
Geo. B. Porter,									23	439	22	361	2	24	17	304	20	395	22	413	15	273	17	160
Simon Snyder,									3	64	6	94	24	464	1	19	7	92	17	110			8	134
Crab,	5	112							7	107	8	137	4	42	14	290	11	248			6	83	18	133
James Buchanan,											18	300	26	406	14	229	22	350	25	203	7	77		
Edward B. Hubley,											6	158	10	252							15	238		
* Lady Lightfoot,													6	29									17	378
* Mountaineer,											15	258	1	4										
James Clark,													8	156										
Bald Eagle,													21	169	11	83	15	92	22	181	7	63	14	93
Kentucky,											4	18	7	57	21	162	28	166	2	14	4	25		
Old Berks,																	1	9	20	273	16	216		
* Brooks,																					10	105		
* Hercules,											2	60												
* Unias,											12	94												
	451	4235	286	2648	252	2176	232	2418	383	4168	468	8858	504	7046	360	4871	377	4962	366	4681	333	4593	327	4708

52,664 Cars.—4,239 Trips—16 Engines.

Those Engines marked thus * in the above table were not the property of the state, but were placed on the road by their manufacturers on trial.

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STATEMENT

Exhibiting the number of Locomotive Engines placed upon the Columbia and Philadelphia rail-way, from the opening of the road, up to October 31, 1838—the time when they commenced running—the name of each engine—from whom purchased—the cost of each, with remarks as to their condition and position at that time, as reported by the late Superintendent of motive power, in his last annual report.

STATEMENT

Exhibiting the condition of the same on the 1st Feb., 1839, when the present Superintendent entered on the duties of the motive power department, the cost of repairs made, and the amount required to put each in good order, on the 1st November, 1839.

Commenced running.	Names.	From whom purchased.	Cost of each.	Remarks.	
May 18, 1835.	Schuylkill,	M. W. Baldwin,	$ 6,316 74	Excellent repair	On the 1st February, unfit for use and has done but little: cost of repairs before it could be at all used, $ 223: amount required to put in order, $1,700.
" " "	Delaware,	do	6,316 74	do	On the 1st February, unfit for use, cost of repairs made, $874:—amount of repairs now required, $1,700.
" " "	Susquehanna,	do	6,316 74	In ordinary,	On the 1st February nothing to be found but its boiler, which was in use in the stationary at Parkesburg, where it yet is; will require $2,000 to make it a good engine.
" " "	Ohio,	do	6,316 74	Excellent repair,	Cost on the 20th February, $ 361 50 for repairs before it could be run: and having been previously run down did but little—it now requires rebuilding and will cost $1,500.
" " "	Columbia,	do	5,580 04	In ordinary,	This engine was run over the inclined plane, near the Schuylkill, between two and three years since and was entirely destroyed—since then its boiler, being all that is left of it, has been resting on stilts at the head of the plane good for nothing but as old iron.
" " "	Pennsylvania,	do	6,316 74	Excellent repair,	On the 1st February, nothing of it to be found except its boiler, which was lying up stairs in the Parkesburg shop, where it yet remains—will cost about $ 2,000 to re build, and then will be a good engine.
" " "	Philadelphia,	do	6,316 74	do	Cost $ 434 50 before it could be used, after coming into the hands of the present superintendent.
" " "	Lancaster,	do	5,850 00	do	Cost $376 00 and has performed but little—is one of the oldest engines on the road and must be entirely rebuilt, will cost $1,500.
July 23 "	Kentucky,	do	6,400 00	do on Schuylkill level,	Cost $1,389 50 before running—is now in good order.
September 7 "	Juniata,	do	6,400 00	do	Cost $432 00—is now in good order.
October 22 "	Brandywine,	do	6,400 00	do	
July 7 "	Albion,	A. & G. Ralston,	6,507 64½	In ordinary, useless for this road,	These are old condemned engines, which, for several years past having been lying in an old building, near the Schuylkill depot, having been thrown there as unworthy of repair— all of which except two, were consumed in the recent conflagration at the Schuylkill depot.
June 18 "	Atlantic,	do	6,507 64½	do do	
May " "	John Bull,	do	6 422 83	do do	
September 1, 1836,	America,	C. Sellers & son,	6,000 00	do	
" " "	Sampson,	do	6,500 00	do	
May 28, "	Planet,	—— Young,	6,500 00	do	
July 22, "	Columbus,	do	6,500 00	do	
" 24, 1835.	Fire Fly,	A. & G. Ralston,	6,507 64½	Sold,	
" 27, "	Red Rover,	do	6,507 64½	do	
Oct. 14, "	William Penn,	Long & Morris,	6,000 00	In ordinary,	
July 13, 1836.	George Washington,	William Norris,	6,300 00	Sent to Portage road,	
May 12, "	Robert Morris,	do	6,300 00	do	
August 19, "	Benjamin Franklin,	do	6,300 00	do	
October 18, "	Washington County Farmer,	do —— Young,	6,300 00	Excellent repair,	Cost of repairs at the shop of William Norris, before ready to be run, $1,292 62½—now in good order.
July 16, "	Comet,	do	6,500 00	Sent to Portage road,	Cost $1,425 00 before moved from the shop, is now in good order.
February, 22, 1837.	Conestoga,	M. W. Baldwin,	7,500 00	Excellent repair,	Cost $833 00 before being used—is now in good order.
March 24, "	Edward F. Gay,	do	7,500 00	do	Cost $491 50—is now in good order.
April 2, "	Parkesburg,	do	7,5 0 00	do	Cost $698 50—is now in good order.
" 7, "	Octorara,	do	7,500 00	do	Cost $676 00—is now in good order.
" 16, "	Downington,	do	7,500 00	do	Cost $133 00—is now in good order.
" 24, "	Pequea,	do	7,500 00	do	Cost $744 00—is now in good order.
May 1, "	Indiana,	do	7,500 00	do	Cost $766 00—is now in good order.
" 9, "	Mississippi,	do	7,500 00	do	Cost $297 00—is now in good order.
" 15, "	Montgomery,	do	7,500 00	do	Cost $746 00—is now in good order.
" 28, "	Wisconsio,	do	7,500 00	do	Cost at Baldwin's shop, $1,354 66—is now in good order.
Jan. 19, "	West Chester,	do	7,000 00	do on Schuylkill level	Cost $452 00—since then has been entirely rebuilt and has performed extra-ordinarily well and still in good order.
Feb. 22, "	Virginia,	do	7,000 00	do	
" 22, "	Paoli,	do	7,000 00	do	Cost $1,769 00, having been rebuilt—is now in good order.
March 3, "	Bald Eagle,	Garrett & Eastwick,	7,000 00	do	Cost $1,400 00 at the shop of Eastwick & Harrison before it was used—it has been lying in the depot for more than a year before, doing nothing.
April 16. "	Telegraph,	do	7,000 00	do	Repaired at the shop of Eastwick & Harrison—cost $800 00.
May 23, "	Enterprize,	do	7,000 00	do	Cost $793 00 before being used.
March 21, "	La Fayette,	William Norris,	6,500 00	Sent to Portage road,	
" " "	James Madison,	do	6,950 00	do	
April 17, "	Bush Hill,	do	7,500 00	do	

September	7	"	Juniata,	do	6,400 00	do
October	22	"	Brandywine,	do	6,400 00	do
July	7	"	Albion,	A. & G. Ralston,	6,507 64½	In ordinary, unless for this road,
June	18	"	Atlantic,	do	6,507 64½	do do
May	"	"	John Bull,	do	6 422 83	do do
September	1,	1836,	America,	C. Sellers & son,	6,000 00	do
"	"	"	Sampson,	do	6,500 00	do
May	28,	"	Planet,	—— Young,	6,500 00	do
July	22,	"	Columbus,	do	6,500 00	do
"	24,	1835.	Fire Fly,	A. & G. Ralston,	6,507 64½	Sold,
"	27,	"	Red Rover,	do	6,507 64½	do
Oct.	14,	"	William Penn,	Long & Morris,	6,000 00	In ordinary,
July	13,	1836.	George Washington,	William Norris,	6,300 00	Sent to Portage road,
May	12,	"	Robert Morris,	do	6,300 00	do
August	19,	"	Benjamin Franklin,	do	6,300 00	do
				do		
October	18,	"	Washington County Farmer,	—— Young,	6,300 00	Excellent repair,
July	16,	"	Comet,		6,500 00	Sent to Portage road,
February.	22,	1837.	Conestoga,	M. W. Baldwin,	7,500 00	Excellent repair,
March	24,	"	Edward F. Gay,	do	7,500 00	do
April	2,	"	Parkesburg,	do	7,5 0 00	do
"	7,	"	Octorara,	do	7,500 00	do
"	16,	"	Downington,	do	7,500 00	do
"	24,	"	Pequea,	do	7,500 00	do
May	1,	"	Indiana,	do	7,500 00	do
"	9,	"	Mississippi,	do	7,500 00	do
"	15,	"	Montgomery,	do	7,500 00	do
"	28,	"	Wisconsin,	do	7,000 00	do on Schuylkill level
Jan.	19,	"	West Chester,	do	7,000 00	do
Feb.	22,	"	Virginia,	do	7,000 00	do
"	22,	"	Paoli,	Garrett & Eastwick,	7,000 00	do
March	3,	"	Bald Eagle,	do	7,000 00	do
April	16.	"	Telegraph,	do	7,000 00	do
May	23,	"	Enterprize,	William Norris,	6,500 00	Sent to Portage road,
March	21,	"	La Fayette,	do	6,950 00	do
"	"	"	James Madison,	do	7,500 00	do
April	17,	"	Bush Hill,	do	7,500 00	do
May	22,	"	United States,	do	7,500 00	do
June	12,	"	Constitution,	do	7,500 00	do
July	4,	1837.	Independence,	M'Clurg, Wade & Co.,	6,250 00	do
March	29,	"	Pittsburger,	do	6,250 00	do
Nov.	18,	1836.	Backwoodsman,			
July	7,	1837.	Two tenders for the last two named engines.		1,100 00	do

These are old condemned engines, which, for several years past having been lying in an old building, near the Schuylkill depot, having been thrown there as unworthy of repair— all of which except two, were consumed in the recent conflagration at the Schuylkill depot.

Cost of repairs at the shop of William Norris, before ready to be run, $1,292 62½—now in good order.
Cost $1,425 00 before moved from the shop, is now in good order.
Cost $833 00 before being used—is now in good order.
Cost $491 50—is now in good order.
Cost $698 50—is now in good order.
Cost $676 00—is now in good order.
Cost $133 00—is now in good order.
Cost $744 00—is now in good order.
Cost $766 00—is now in good order.
Cost $297 00—is now in good order.
Cost $746 00—is now in good order.
Cost at Baldwin's shop, $1,354 66—is now in good order.
Cost $452 00—since then has been entirely rebuilt and has performed extra-ordinarily well and still in good order.

Cost $1,769 00, having been rebuilt—is now in good order.
Cost $1,400 00 at the shop of Eastwick & Harrison before it was used—it has been lying in the depot for more than a year before, doing nothing.
Repaired at the shop of Eastwick & Harrison—cost $800 00.
Cost $793 00 before being used.

RECAPITULATION.

In excellent repair, twenty-seven—In ordinary, nine—Sold, two—Sent to Portage road, twelve—Toal, fifty.

ADDITIONAL STATEMENT.

Exhibiting the number of Locomotive Engines placed upon the Columbia and Philadelphia Rail Road, from the 31st October, 1838, to 31st October, 1839, the time when they commenced running, &c., as above,

Commenced running.			Names.	From whom purchased.	Cost of each.	Remarks.
March	1,	1839.	George B. Porter,	H. R. Campbell,	$7,500 00	Excellent repairs,
"	11,	"	Andrew Jackson,	do	7,500 00	do
"	13,	"	Simon Cameron,	William Norris,	7,500 00	do
"	15,	"	Simon Snyder,	do	7,500 00	do
April	1,	"	James Buchanan,	H. R. Campbell,	7,500 00	do
"	15,	"	Edward B. Hubley,	Baldwin & Co.,	7,500 00	do
"	18,	"	James Clarke,	do	7,500 00	do
July	1,	"	Old Berks,	D. H. Doterer,	7,500 00	do
August	8,	"	Henry A. Muhlenberg,	do	7,500 00	do
May	1,	"	The Crab,	Ross Winans,	7,500 00	In ordinary,

of the season, and is only closed when the water is so high, as almost to preclude the use of the pool, was not apparent, it has been thought best to suspend the construction of it for the present. The pit has been guarded against the irruption of water from the canal, by an embankment thrown across at each end.

The other two have been completed, and are in use. They are combined locks built of rubble masonry, and sheathed with plank. The appropriations made have not been sufficient to pay for them in full. The work done and materials delivered at the upper guard lock, amounting to ten thousand three hundred and ninety-eight dollars and sixty-five cents have been finally paid for, but a balance remains upon the others, as will be seen by the following statement:

Final estimate upon lower guard lock and lock No. 1,	$30,089 65
Irons furnished,	628 52
	$30,718 17
Amount paid by former and present supervisors,	23,315 96
Balance due,	$7,402 21

The vertical wall between the guard locks and lock No. 3, is all in bad condition; much of it having fallen entirely down, leaving the turnpike on the berm side, very insecure and dangerous. This is especially the case between locks No. 2 and 3. The Clark's creek aqueduct, a wooden trunk of four spans, supported by three stone piers, is in a shattered condition. It was intended to have been rebuilt during the present season. But the difficulties attending the derangement of fiscal affairs, has prevented it. It is necessary, however, that it should be renewed during the next fall and winter. In conformity with a resolution of the board, the width of the trunk, will be increased to thirty-five feet.

The Stony creek aqueduct is more defective and insecure. It will not be safe to postpone the renewal of it, for another year.

The west end of the Southern pier of the Conecoago aqueduct, gave way early last summer. It has been secured through the season in a sufficient but temporary manner. Materials are provided for the reconstruction of the pier, which will immediately be commenced.

The planking and frame work of the aqueducts over Conoy and Chiques creeks, require extensive repairs. The piling at the head of the latter must be very defective, as the water gushes in steams through the abutment.

In lock No. 5, (the lower lock at Harrisburg,) the original stone flooring still remains which is very defective, and is the occasion of much leakage; it should be taken up, and a timber bottom substituted, as has been already done in all the other locks built upon that plan. The weigh lock at Middletown, will need considerable attention and repair. The cradle or platform is not of sufficient length to weigh a long and heavy laden boat, without injury. The irons supporting it are too light; they have been broken twice during the last summer.

An increased vent should be given to the water, in order to facilitate, and expedite the opperation of weighing.

The outlet locks into the Swatara at Middletown, were found to be so defective as to render any permanent repair impracticable. It was therefore determined to construct an entirely new lock, adequate to the whole lift of the two original locks, which was seventeen feet. The depth of the chamber being so great, (23 feet,) and the gates required by the usual plan, so heavy, the drop gate at the head of the lock, used in locks of great lift on the Lehigh navigation, has been adopted. This gate is so constructed, that when the chamber is full it sinks by means of its own specific gravity, and when empty is retained in its proper position, by the pressure of the water on the upper level. In filling the chamber, a set of horizontal wickets, placed in the frame on which the gate rests, when down, is opened, and the water rushes through a well, constructed in the head of the lock, and under a solid breast-work of timbers, laid upon each other and firmly built into the wall at each end. The weight of the lower gate is diminished by a permanent breast-work of six feet. The chamber has been increased in dimensions to one hundred and thirteen, by eighteen and a half feet, in order to admit the passage of the various river craft into the adjoining basin. The work is now in progress, under the direction of Jacob B. Lyon, Esq., supervisor, and will be completed in time for the spring trade upon the river. Although the face of the chamber will be constructed of the ashlar of the old locks; yet, on account of the necessity of building much of the wall during the winter when mortar cannot be used, it was thought best to line the whole of the chamber with plank. This will allow the grouting to set, which shall be introduced in the spring, into such portions of the wall, as have been built dry. The expense of this lock will be about fifteen thousand dollars.

Lock No. 4, Columbia line, (at York Haven Ferry) has been for years in bad condition. As it has been several times partially rebuilt, during the winter months, without any permanent benefit, it was thought necessary to construct an additional lock, so that the the original might be thoroughly and completely repaired. It has consequently been placed under contract, and will be completed for use early next summer.

The locks on the division, other than those already specified, will nearly all need new gates, and sheet-piling. Several pairs of gates have been provided, and the remainder should be ready before the navigation re-opens. New waste wiers will be required on three successive levels, below Clarkes Ferry dam.

Between Locks No. 4 and 5, Columbia line, there is no wier. Great inconvenience has hitherto arisen from this deficiency. There is one intended to be inserted during the winter. The wier on the Columbia level, was taken out during the last year, and the place it occupied filled up: this should be immediately replaced, as one of great consequence.

The bridges crossing the canal, between Duncan's Island and Middletown, are of short span, and by contracting the canal, offer much obstruction to the navigation. As many of them are now in a state of decay, and require, in many cases, entire renewal; it is advisable that the spans be increased to the dimensions adopted upon other portions of the canal. There are eleven farm, and three road bridges of this description, which have been placed under contract, and in which the desired improvement will be made without much increase of expense, over the cost of the repairs that are strictly necessary.

The towing path bridge, across the entrance of the Basin, at Harrisburg, is too much decayed to admit of repairing. It is intended to replace the low level platform with embankment, and substitute abutments of stone, for the timber trussels, which support the main bridge.

Several of the bridges across the canal, at Marietta, which are of very long span, have failed. It is thought that the canal is here too wide to make use of the single brace bridge, with advantage. Those which have already given way, will be renewed with structures of stronger model and greater durability.

The undersigned would urge upon the board, the necessity of doubling all the locks upon this division, during the next year. The opening of the Susquehanna and Tide water canal, in the coming spring, and the natural increase of trade, will in all probability, so augment the tonnage upon the main line, that single locks will be entirely inadequate to its free transmission.

Next, in importance, to the free navigation of the Delaware, during the winter months, by means of ice boats, is the early admission of water into the canals. By these means the importer may safely rely upon the regular arrival of his merchandise, and the western merchant with confidence depend upon the receipt of his commodities, through our improvement, at least six weeks earlier than by the northern route. Our state, great, alike, in trade abroad, and productions at home, in commerce and manufactures, in domestic resources, and foreign exchange, could then know no rival. Her great metropolis would become the general mart of foreign imports, for the western world and her public works, the grand thoroughfare to that mighty region.

ESTIMATE OF ORDINARY REPAIRS.

Eastern Division.

Repair of waste wiers,	$200 00
2500 perches vertical wall,	2,000 00
Repairs of locks,	3,700 00
Roadway of Swatara aqueduct,	500 00

Conewago aqueduct,	700 00	
Conoy, "	250 00	
Chiques, "	600 00	
Headgates of Swatara feeder,	100 00	
Ordinary repairs of towing path, &c.,—44 miles, at $3 per perch,	3,200 00	
		$21,250 00

EXTRAORDINARY REPAIRS—OR, NEW WORK ON OLD LINES.

Towing path bridge at Harrisburg,	$2,500 00	
Road and Farm Bridges,	11,000 00	
Clarkes creek aqueduct,	7,000 00	
Paxton, " "	6,000 00	
Six new waste wiers,	3,300 00	
Outlet lock at Portsmouth,	15,000 00	
Additional lock at York Haven Ferry,	7,500 00	
		$52,300 00
Balance due upon additional locks at Clarke's Ferry,		7,402 21
To which it is recommended to add, doubling 11 locks at $9000,		99,000 00
And outlet locks at Columbia,		15,0 0 00
		$173,702 21
Ordinary repairs,		21,250 00
		$194,952 21

All which is respectfully submitted,

W. K. HUFFNAGLE, Engineer.

[No. 11.]

Juniata Division, Report of William E. Morris, Engineer.

THE JUNIATA DIVISION

Is one hundred and twenty-six miles in length, from the basin at Hollidaysburg to the junction at Duncan's Island.

Numerous and extensive repairs were necessary, last spring, to place the canal in good order; and the most active exertions were required on the part of the supervisors, to render their divisions fit for business. The navigation commenced on the 19th of March, and has continued, through the season, without long continued interrup-

tions. Owing to the severity of the weather and the late appointment of officers, but a small portion of the deposites in the bed of the canal, and the pools of the dams, was removed previous to the opening of the navigation.

Much therefore remains to do, during the ensuing winter. To secure the safety of the canal, many of the embankments should be raised and strengthened. This would in a great measure prevent the occurrence of breaches, and be ultimately a saving of expense.

Estimated cost, $10,000

THE LOCKS,

They are constructed upon the "composite" plan, and are ninety-one in number. Above Huntingdon the lining was renewed in the summer of 1838. Below Huntingdon but little new material has been put upon them since their construction. A large proportion must have entire new lining, new gates, and sluices, before the business of another season shall commence. Bills have therefore been furnished, and contracts made for the delivery of the necessary material, and the work will be commenced immediately after the close of navigation, this fall.

Estimated cost, $20,000

There are two locks, that must be taken down to their foundations, and rebuilt.

Estimated cost, $6,000

A Guard Lock should be constructed in the Long Narrows, instead of the single sett of gates, at present there; and which require a thorough repair. Much delay is frequently occasioned by the difficulty of passing these gates.

Estimated cost, $3,000

AQUEDUCTS.

The repairing of nine of the uncovered aqueducts has been contracted for, during the present season; at all of which the work is actively progressing.

The aggregate length of trunk is 630 feet.

The width of water way, by direction of the Canal Board will be thirty-five feet.

Estimated cost, $30,800

Early in August one span of the Shaffers's Ford aqueduct, one hundred feet in length, unexpectedly gave way—the timber of the frame supporting the trunk, having become decayed, and unable longer to sustain the weight upon them, broke off at the piers, and the whole span fell into the river. It was rebuilt, and boats, again passed the aqueduct upon the eighth day.

Much credit is due the supervisor, Mr. David Woods, for the active and energetic measures taken to repair the breach. This aqueduct consists of four spans, two of which have recently been renewed; and materials have been furnished for rebuilding the remaining two.

Two spans of the aqueduct at Jack's Narrows, require a similar repair, and for which materials have also been provided.

Estimated cost to complete, $5,500

The appropriation to the aqueduct at Duncan's Island is thought sufficient. The new trunk will be extended across the stream during the winter.

THE WASTE WIERS,

Were originally constructed entirely of wood; and seventeen need immediate renewal.

The abutments should be made of stone.

To seven others some repair is necessary.

Estimated cost, $10,600

BRIDGES.

The superstructure of many of the bridges like most other work composed of timber, has become too much decayed to last another season.

These are thirty-eight in number, and have been put under contract.

Estimated cost, $9,500

THE DAMS

Are in good order, and appear permanent. A few need gravelling and some small repairs.

Estimated cost, $1,000

INSIDE SLOPE WALL.

The same protection, to the inside of the banks, as before recommended for the canal of the Western Division, should be introduced upon the Juniata. About thirteen miles are now in a fit state to receive the wall.

Estimated cost, $6,000

FERRY AT NORTH'S ISLAND.

A new rope required, and some repairs to machinery.

Estimated cost, $600

RECAPITULATION.

Clearing out bed of Canal, and raising and strengthening embankments,	$10,000
Locks,	29,000
Aqueducts,	36,300
Waste Wiers,	1,600
Bridges,	9,500
Dams,	1,000
Inside slope wall,	6,000
Ferry at North's Island,	600
	$103,000
Add for contingencies,	5,000
Total estimated cost,	$108,000

The annual cost of maintaining the rope Ferry varies little from seven hundred dollars. The machinery is propelled by water taken from the canal. At no distant day, a towing path bridge should be substituted for the present method of crossing.

Estimated cost, $25,000

Respectfully submitted,

WILLIAM E. MORRIS, *Engineer.*

[No. 12.]

Report of William E. Morris, Engineer.

RESORVOIRS.

ENGINEER'S OFFICE, Hollidaysburg, Nov. 1, 1839.

To JAMES CLARKE, ESQ., *President of the Canal Board.*

Sir:—Having in compliance with the directions of the board, completed the surveys, necessary for the location of the reservoirs, near "the terminations of the Allegheny Portage Rail Road;" I beg leave to submit the result in the following report:—

The Western termination of the Portage Rail Road, and the commencement of the Western Division of the Pennsylvania canal, are at Johnstown. The canal is supplied by water, taken by feeders from the Little Conemaugh river and Stony Creek, which form a junction at this place. The valleys of both these streams, and their tributaries have been examined for the purpose of selecting the most favorable site for a reservoir.

The first inquiry that presents itself, and upon which, the size of the reservoir depends, is the quantity of water requsite to supply the canal for the *most active* trade, and during the longest continued drought.

Three months *without rain*, and a trade that can be passed by two hundred locks full of water per day, are considered safe data for calculation. Under the most favorable circumstances, one lock full of water will pass two boats; under the greatest *disadvantages*, with a brisk trade, two locks full are sufficient for the passage of three boats. Three hundred boats per day, at an average of thirty tons per boat, would pass a trade equal to nine thousand tons per day.

The greatest amount of tonnage, that passed this season upon the Portage rail road, in one day, was about fifteen hundred tons.

The quantity of water, required for the amount of trade just mentioned, will be as follows: for the canal fed from the dams at Johns-

town, which is about six miles in length; and to supply the weigh lock, the waste water from which, is discharged into the Conemaugh, and taken again into the canal at the next dam below.

Two hundred locks full per day, including waste, would be equal to	2,100	cubit ft. pr min.
Leakage and evaporation upon six miles canal,	600	do
Weighing three hundred boats,	2,000	do
Greatest demand,	4,700	do
Deduct amount estimated by Mr. Welch, to be furnished per minute, by the Conemaugh and Stony creek in the dryest seasons.	1,700	do

Amount required *per minute* for the reservoir, 3,000

Which multiplied by 129,600 the No. of minutes in three months, equals three hundred and ninety millions, nearly the required available contents of the reservoir.

According to the estimate of Mr. Welch, for the same trade, the quantity of water required *from the reservoir*, to supply the canal between dam No. 3, of the Ligonier line; and the next pool below, a distance of fourteen miles, (being the longest piece of canal above Leechburg, fed from one dam) is 1,643 cubit feet per minute; and for the canal below Leechburg, 2,450 cubit feet per minute; both these amounts are less than that required, as shown above, for the canal at Johnstown.

The valley of Stony creek is not well suited for the construction of reservoirs. Its descent is too great, and the stream in time of floods, by far too large and unmanageable, some of its head water flow from the neighborhood of Berlin, in Somerset county; and from that point to Johnstown, its branches drain almost the whole extent of country between the Allegheny Mountain and the Laurel Hill. Great as may be the importance of securing an ample supply of water; it is no less important to ensure the permanence and stability of the dams, and for this purpose, to avoid streams so powerful as to endanger the safety of the works.

Its branches, with the exception of the Quemahoning are too short, and furnish too small a quantity of water to fill a reservoir of the required size.

This latter stream unites with Stony creek, about ten miles above Johnstown. It is rapid, and the valley narrow, possessing few of the advantages found upon the south fork of the Conemaugh.

Upon the main branch of the Conemaugh, there is but one point at which a reservoir sufficiently capacious could be formed, and its construction there, would flood the village of Jefferson, and cover the rail road for several miles. This site, therefore, is excluded from consideration.

Of the other branches, the south fork is the only one that drains a sufficient extent of country, to render *certain* a supply of wate

the reservoir. The junction of this stream with the main branch, is about eight miles from Johnstown.

There can be no doubt of the sufficiency of this stream, to fill a reservoir, of any desired capacity. It was carefully gauged in September, after one days' rain, and found to discharge in twenty-four hours, sixty millions of cubit feet of water. At the same time, there were flood marks along the stream, two feet higher; it would be a moderate estimate, to suppose a flood of two feet additional height, it would discharge three times as much water; equal to one hundred and sixty millions of cubit feet, in twenty-four hours.

The most suitable point upon this stream for the construction of a reservoir, is about two and one fourth miles from the mouth; and is the same recommended in 1834 and '35 by Mr. Welch.

A dam at this point, that would raise the water sixty-two feet, would be eight hundred and fifty feet long on top, would form a reservoir containing, four hundred and eighty millions of cubit feet of water, and cover four hundred acres of ground.

This site combines more advantages for the construction of a reservoir, than any other upon the waters of the Conemaugh, or Stony creek. It is not remote from Johnstown, and is less than two miles from the rail road. It is situated upon a stream that will furnish an abundance of water to fill the reservoir; and from the floods of which but little danger is to be apprehended, if proper channels are constructed for their discharge. The valley is narrow at the dam, and widens immediately above, into an extensive basin. The land intended to be flooded, except a few acres, is covered with timber, and consequently but small injury will result to private property. There is solid rock at both ends of the dam, in which channels may be cut for the discharge of waste water, in time of floods. This fact has been satisfactorily ascertained by a full examination, by means of drifts and shafts sunk for the purpose. Abundance of the best material for the formation of the dam, is found convenient. The "feed water" with but little loss from evaporation will pass to the canal at Johnstown, down the natural channel of the stream, which is narrow and protected from the sun by woods and mountains. Allowing the surface of the reservoir to be reduced two feet by evaporation, there will remain for supplying the canal, four hundred and fifty millions of cubit feet of water; which will yield for three months, three thousand five hundred cubit feet per minute; being sixty millions of cubit feet of water more than the amount required, equal to five hundred cubit feet per minute for three months.

Two plans for the dams, present themselves for consideration, one to be constructed in the usual manner of crib dams, with timber and stone—having a wier upon the top, over which the waste water shall pass, in times of freshets. The other to be formed by a mound or embankment of stone and earth, made perfectly water tight, and raised ten feet above the surface of the pool—having a waste or channel cut in *solid rock* at one or both ends of the dam, for the passage of the flood water.

To the former plan there are serious objections, great difficulty would be experienced in uniting the body of the dam with the embankments, in such a manner, as to prevent leakage, under so immense a pressure; it would require a large expenditure to secure the base of the dam from undermining; the perishable nature of the material used in its construction, would render early and continued repairs necessary, and thus furnish another constant source of expense to the commonwealth. By the latter plan, both of these objections are avoided, and the dam, when once properly constructed, promises to be permanent and durable, and capable of being maintained at small expense.

The sluce for passing the "feed water" should be placed through the dam, near the surface of the ground, for the purpose of rendering the entire content of the reservoir available.

It may consist of cast iron pipes for about sixty feet next the water, and a cut stone culvert, the remainder of the distance through the dam; a sett of stop cocks faced with brass, should be placed at each end of the pipes. Those at the lower end for general use, and those at the upper end, as safety gates.

The pipes as laid, should be tested by a force pump, under a pressure, equal to three hundred feet head of water.

The accompanying plans and specifications, contain a detailed description of the kind of dam, sluice, &c., which I recommend to the adoption of the Board.

ESTIMATE OF WORK.

400 acres clearing ground covered by water,
8 acres grubbing, base of dam and wastes,
15,000 yards excavation, foundation for dam, puddle ditches, &c.,
40,000 do do rock in wastes,
110,000 yards embankment of dam, good earth,
100,000 do do do slate and stone,
2,000 yards puddling about sluice,
5,000 perches ruble wall, laid in cement,
6,000 perches slope wall, dry,
3,00 perches cut wall for sluices, laid in cement,
7½ tons wrought iron,
75 tons cast iron for pipes,
10 stop cocks with brass facings, lever and screw,
House for sluice tender.

Estimated cost $188,000 00, exclusive of damages, engineering, and office expenses.

The canal at the Eastern termination of the Portage rail-way commences at Hollidaysburg, and is supplied by the water of the Beaver dam branch and the south fork of the Juniata. The latter is the only stream upon which a sufficient reservoir can be constructed.

The quantity of water required for the same amount of transportation assumed as the basis of the calculations for the Western reservoir will be, as follows: for the canal from this place to the next feeder dam

at Frankstown, a distance of 3 miles; and the weigh-lock, the waste water from which flows into the pool of the Frankstown dam.

200 locksfull, including waste,.....	2100	cub. ft.	pr.	minute.
Leakage and evaporation upon 3 miles canal,	300	"	"	"
Weighing 300 boats,.....	2,000	"	"	"
Greatest demand,.....	4,400	"	"	"
Deduct natural flow of streams in dryest seasons, ...	2,400	"	"	"
Amount required from reservoir,.....	2,000	"	"	"

Which in three months is 260 millions of cubic feet, the required capacity of the reservoir.

The general features of the valley of the South fork of the Juniata are such as to furnish frequent sites, in some respects favourable for the formation of reservoirs. The decent is moderate, and the width of the flats irregular—abounding in narrow points, where dams could be cheaply constructed; and widening into basins above them.

Two sites were mentioned by Mr. Welch, in his report made in 1835. One at Seth's mills, eight and one-half miles, and the other, one and a half miles, above the head of the present feeder. Into the one at Seth's mills, but a small portion of the water of the South fork, can be collected; it being situated above the junction of the following branches, viz: North Poplar run, Cove creek, Dry run and South Poplar run. These branches at all times contribute at least three-fourths of the volume of the main stream. A dam thirty feet high would form a pool, containing 160 millions of cubic feet of water; and cause one furnace, one saw mill and several dwelling-houses to be overflowed. The capacity of the pool could not be materially increased. These facts, together with the remote situation of this point, induced an immediate abandonment of its consideration.

At the last mentioned site, one and a half miles above the head of the feeder, a dam thirty feet in height, would be 2870 feet in length on top —would cover 450 acres of land, and contain 272 millions of cubic feet of water. By its erection, one grist mill, one saw mill, a tavern, store and distillery, and several dwellings would be flooded; a roofed bridge over the river, and about one mile of turnpike road would be destroyed. The land is nearly all under cultivation and inferior to none in the valley. The hill at western side of the valley, is composed of a light shelly slate rock; an entirely unfit material, in which to construct a waste: That upon the eastern side, is a compact clay, intermixed with stone, and gives little indication of rock upon the surface; nor was the appearance more favourable upon excavating a drift 35 feet into the hill.

The plan recommended for the construction of a waste, at the western reservoir, is much to be prefered to any other. If it be adopted here, *solid rock*, for the waste is *indispensable*.

ESTIMATE OF WORK.

150 acres clearing land covered by water.
36,000 yards excavating, foundation of dam, puddle ditches, &c.
310,000 yards embankment of dam, earth and stone.
30,000 yards rock excavation in waste.
10,000 perches slope wall.
1,500 perches wall for sluices.
4½ tons of wrought iron.
60 tons cast iron.
10 stop cocks with brass facings, screw and lever.
House for sluice tender.
Estimated cost, exclusive of damages and office expenses,..... $150,000 00

Three other sites were examined, two of which are not worthy of notice. At the third, rock was found suitable for a waste. It is situated near the residence of Judge M'Ewen, one and a half miles *below* the point, at which Mr. Welch's survey commenced, viz: "the head of the feeder," and one and a half miles from the basin at Hollidaysburg.

A dam at this point 28 feet in height, would be 1230 feet long on top, would form a reservoir, the area of which would be 450 acres, and its available content 320 millions of cubic feet of water.

It may be objected to this location that the surface of water in the feeder is seven feet above the surface of the valley at the dam; and consequently, all that portion of the water of the reservoir, contained *below* the level of water line in the feeder, cannot be drawn into the canal, and is unavailable. This unavailable portion however, is not included in the above stated "useful content" of the reservoir; it amounts to but 12 millions of cubic feet and would not supply the canal one week, and the capacity of the reservoir is amply sufficient without it.

A more serious objection arises from the fact that the rock before mentioned as suitable for the waste, is upon that side of the vallay, occupied by the feeder; a portion of which must be removed in the construction of the waste.

This circumstance renders it necessary to place the sluice for passing the "feed water" on the side of the vailey *opposite* the feeder, and to convey the water, either *over* the stream by an aqueduct, or beneath its bed in iron pipes.

This structure, properly constitutes an item in the cost of the reservoir at this point, and is therefore included in the estimate.

ESTIMATE OF WORK.

150 acres clearing land overflowed by water.
5 acres grubbing site of dam and wastes.
16,500 yds. excavation of foundation of dam, puddle ditches, &c.
50,000 yds. embankment—good earth.
55,000 yds. ditto slate and stone.
2,000 yds. puddling about sluice.

25,000 yds. rock excavation of waste.
1,500 prs. masonry of sluices.
5,000 prs. slope wall.
4½ tons of wrought iron.
60 tons of cast do.
10 stop cocks, with brass facings, screw and lever.
House for sluice tender.

Conveyance for "feed water" across rises,.....$15,000 00
Estimated cost, exclusive of damages, office expenses, &c.....$100,000 00

In making the foregoing comparison of cost, the corresponding items of work at the two sites were estimated at the same prices.

At the latter site, no manufactories, mills, or other water works, nor any valuable buildings, would be destroyed. The land that would be covered, though principally cleared, is of less value, than at either of the other proposed sites. It is three miles nearer the basin at Hollidaysburg. By its construction at this point, one and a half miles of the feeder would be dispensed with.

Both sides of the proposed pool, are bounded by steep hills, upon which there are few dwellings. At any other part of the valley, one or both sides of the reservoir would be skirted with farms. To the people generally and the *owners* of property in the valley, in particular, the selection of the lower site, will give far the least dissatisfaction. There would also be a material saving in cost of construction.

Estimated cost of upper site,..... .$150,000 00
" of site at Judge M'Ewens,.....100,000 00

Difference in favour of the latter,.....$50,000 00
To this may be added the greater amount of damage at the upper site, equal at least to.....15,000 00

Total difference in favour of the lower site, ...$65,000 00

Should rock suitable for a waste be found on the Eastern side of the valley, for which examinations are now being made, the aqueduct will be dispensed with, and thus there would be an increased saving of $15,000 to the commonwealth.

I therefore recommend the adoption of the lower site.

The foregoing calculations are made for a dam, constructed in the same manner, as recommended for the western reservoir, omitting the vertical wall. The accompanying maps, plans and specifications, exhibit the particulars, in detail.

Respectfully submitted.

WM. E. MORRIS, *Engineer.*

[No. 13.]

Report of William E. Morris, Engineer.

WESTERN DIVISION.

ENGINEER'S OFFICE, HOLLIDAYSBURG,
November 1st, 1839.

TO JAMES CLARKE, ESQ.,

President of the Board of Canal Commissioners.

SIR :—I have the honor to present to the Board, my annual

REPORT

Upon the situation of the finished work under my charge.

WESTERN DIVISION.

Extending from Pittsburg to Johnstown, distance one hundred and five miles. The navigation of this portion of the canal with few interruptions, has been maintained in good order, for the passage of boats, during the entire season. It was opened on ———.

In the bed of the canal leading from the aqueduct at Pittsburg, to the Monongahela and Allegheny rivers, deposites of sand have been suffered to accumulate to such a degree, and the locks to become so dilapidated, as to be utterly impassable for boats, and in the Monongahela branch, the depth of the sand and mud is so great, as even, to prevent the passage of water to the river. By the direction of the Board, contracts have been entered into, for the work necessary to place these connexions in navigable order.

Estimated cost,	$9,000

This estimate does not include the cost of extending the Grant's Hill Tunnel, from its present terimination, to the Fourth street bridge, [distance two hundred and fifty feet,] and completing the embankment or filling above the arch.

Estimated cost,	$7,000
Deduct amount appropriated,	5,000
Amount required to complete,	$2,000

There was a contract entered into some time previous to the present season, for the completion of the tunnel to Fourth street, which has been abandoned. It is equally necessary that the upper end of the tunnel should be extended to Seventh street, distance two hundred and thirty-two feet.

Estimated cost.	$6,500

Unless the tunnel is completed by an extension at both ends, the Monongahela branch can only be kept open, by frequent removal

from the prism of the canal, the sand and mud brought in from the sides of the hill, by every rain.

The bottom of this canal, throughout its whole length is obstructed by sand bars and mud deposites, and hill slips, which appear to have been for some time accumulating. It is of the first importance to the navigation, that the bottom of the canal, at all points should be free from obstructions. Their existence, in a few places, has the effect to diminish the business capacity of the whole length of the canal. A small portion only of this kind of work, necessary last spring, could be done previous to opening the navigation. The requisite funds should by all means be provided to enable the supervisors to complete it during the approaching winter.

Estimated cost of clearing out canal, raising and strenghthen-towing path, $17,000

The constant wave in the canal, produced by the passage of packet and freight boats, has very much abraded the banks and diminished their width. The usual method heretofore pursued to prevent this, has been to line the inside of the banks with loose stone. The action of the water however soon displaces the stone, and in a few months they are found in the bottom of the canal. A better plan, and found by experience to be permanent, is to construct a light slope wall, backed in with slate, started about one foot below surface of water, and raised the same height above it. The first cost of this wall will be greater than a covering of loose stone; but from its longer durability, and the consequent reduction of the expense of keeping the banks in repair, it will in a short time be found good economy. Nearly the whole length of the embankments of the canal should be protected in this manner. It should be done gradually—during the ensuing winter and summer, I would recommend that about thirty miles should be thus walled.

Estimated cost, $12,000

THE LOCKS,

Upon the Western Division are built of cut stone, laid in cement. The stone at many of them, have been found of too soft a nature, to resist the continued action of air, frost and water, and are crumbling away. The cement was not a good article, and is much washed out, leaving the joints open, and the walls leaky. There are five locks, at all of which the stone and cement, have so much failed, that it is with great difficulty, boats are passed. The gates can only be forced open by means of a windlass, many of the joints are filled with wooden wedges, the walls incline inwards and have every appearance of collapsing. It is absolutely necessary to rebuild them within the next year. This cannot be done in freezing weather. The only way in which a good job can be made, is by the construction of new locks, alongside of the present ones; which is earnestly recommended to the Board. Most of the locks upon this line require new gates and sheet piling.

Rebuilding five Locks,	Estimated cost,	$40,000
Repairing fifty-six do	do do	12,000

THE DAMS,

Are generally in good order, but require gravelling.

Estimated cost, $1,500

Contracts were entered into this season for cribbing lower slope of Dam No. 2, on the Ligonier line, and No. 3 on the Kiskeminetas and Conemaugh line.

The cost when completed will be, $8,500

THE AQUEDUCTS,

Will not require a large expenditure, the ensuing year. Many of the bearing beams of the large aqueduct at the mouth of the Kiskiminetas need renewing. Several others require partial repairs.

Estimated cost, $4,000

THE BRIDGES,

Were originally constructed with wooden abutments. That upon berme side stands in the canal, contracting its width to such a degree, that two boats are unable to pass at the same time. Contracts have been made for rebuilding thirty-five, with stone abutments, and forty feet width of surface line. Twenty others should be placed under contract immediately.

Estimated cost, $27,000

WASTE WIERS AND CULVERTS.

The latter are in good repair, but some of the wastes must be partially renewed, and many need repairing.

Estimated cost, $1,500

LOCK-HOUSES.

There are forty at which more or less repair is necessary.

Estimated cost, $2,000

RECAPITULATION.

Allegheny and Monongahela branches at Pittsburg,	$9,000
Completing Tunnel to Fourth street,	2,000
Bed of canal and embankments,	17,000
Inside slope wall,	12,000
Locks,	52,000
Dams,	10,000
Aqueducts,	4,000
Bridges,	27,000
Waste weirs and culverts,	1,500
Lock houses,	2,000
	$136,500
Add for contingencies,	5,500
Total estimated cost,	$142,000

The rebuilding and repairing of Locks, replacing that portion of the mechanical work constructed of wood, necessary on account of its natural decay. Extending the span of the bridges, and substituting stone, in place of wooden abutments, constitute the principal items of cost. The substitution of stone for wood in bridges and waste weir abutments, and a permanent manner of making repairs, cannot be too strongly recommended.

WILLIAM E. MORRIS, *Engineer.*

[No. 16.]

Report of William K. Huffnagle, Engineer.

DELAWARE DIVISION.

ENGINEERS' OFFICE, Lancaster, November 1, 1839.

TO JAMES CLARKE, ESQ.,

President of the Board of Canal Commissioners.

SIR :—In compliance with instructions, received from the secretary of the board, I have the honor to submit the following report upon the several divisions of the public improvements, under my charge.

DELAWARE DIVISION.

This portion of the public works, suffered severely from the disastrous freshet of the 27th January last. The Delaware at Easton, rose to the almost unprecedented height of twenty-two feet above low water mark, and in its impetuous course, overflowed all the low levels of the canal, breaking in the towing path banks, and filling with earth, and in many cases its entire prism.

The Lehigh, actuated by the same causes, overflowed the guard banks of the dam at Easton, cutting around the southern abutment, and finally carrying off, that heavy body of masonry in a solid mass; thereby creating an outlet, through which the river commenced rolling, with a fury and force apparently indomitable. The dam, deprived of its protection, by the loss of an abutment, was in a most precarious situation, leaving its safety entirely dependent upon the most energetic measures.

The patriotic spirit of the inhabitants of Easton, did not long remain inactive. The destruction of an important portion of the public works, was rapidly progressing and each individual felt interested in its preservation. A public meeting was immediately held, and the

work undertaken by the guarantee of individuals; arrangements being made with the Easton bank, and having secured the valuable services of Mr. S. Chapin, a heavy force was instantly raised, and the breach attacked with a vigor, and under circumstances, which, must be fully known, to be properly appreciated.

The most inclement weather prevailing, exposed and wet, they encountered and overcame every difficulty. The force of the current was broken, by large masses of stone being thrown into the breach, and eventually gravelled; thus forming a barrier, which proved effectual in successfully resisting the later, and almost as powerful freshet of the 8th of April. After six weeks incessant labor, the Lehigh was again brought into subjection, and the dam preserved. This division extends from Bristol to Easton, and is fifty-nine and three-fourth miles in length, having twenty-three lift locks, varying from six to ten feet lift. The canal and locks, are calculated for boats of sixty-seven tons burthen. The total rise, from mid tide at Bristol, to the top water level of the dam at Easton, is one hundred and sixty-four feet. This dam is eleven feet and seven eighths inches, above low water in the Delaware. This division was commenced in October, 1827, and filled for operation in October, 1830, and cost, one million, two hundred and three thousand, seven hundred dollars. It contains in addition to the twenty-three lift locks, two guard locks, one outlet lock, and one tide lock at Bristol. They are constructed of Rubble masonry, laid in cement, on timber bottoms, with longitudinal sills and upright posts, faced with plank spiked to the timbers. The tide lock, and outlet locks, at Bristol and Easton, are twenty-two feet wide, and one hundred feet clear in the chambers. The natural decay of pine and oak timber, and the exposure to which that in the mechanical work had been subjected, has rendered it necessary to replace a majority of the timber upon this division.

The gates, caps, and lining of the locks, have generally been nine years in use, and in consequence, their condition can readily be imagined; situated as they are, upon a line of canal passing annually, such an immense amount of coal and other merchandise.

The condition of the line, when placed under the charge of the undersigned, was such as to render the most energetic measures necessary, to get it into operation at the regular period, in order to give the Lehigh company, the usual facilities for their coal trade.

The dam at Easton, being as previously described, it was deemed upon a careful examination, and estimate, most prudent to abandon the idea of a thorough repair, and to make the necessary arrangements for the construction of a new dam. The site selected was immediately below the old dam, and located in the excavation made by the overfall, thereby securing a foundation upon solid rock, and having also the advantage of a connection with the old dam, by shores or timbers extending, and bolted into the solid material it contained. A letting was accordingly held on the 10th of August. The condition of the monetary affairs of the commonwealth, at that time, rendered the period of her ability of meeting engagements uncertain, and opera-

ted unfavorably with regard to bidding for the work. The proposals were predicated upon the probable period of credit to be given to the commonwealth, and to the estimate of the work, was added the enormous interest, which money at that time commanded. This course swelled the bids far beyond the real value of the work, and induced the undersigned to make an estimate of such repairs, as would render it safe throughout the season, and postpone the erection of the new dam, until the coming summer; such estimate having been made, and a comparison drawn between the proposals, for executing the new work, and temporarily repairing the old, it was deemed most expedient to defer the letting, and repair the old dam.

On September, 25th, a letting was held at New Hope, for the general repair of this division; and at the same time bids were received for building the dam at Easton, during the ensuing summer. The bids being received, the dam was allotted to Solan Chapin, upon favorable terms. The condition of this division, having been described in the report made by the engineer, appointed to estimate repairs, it will be unnecessary to recapitulate, except merely to refer to the several repairs upon the mechanical work, which were made previous to the opening of the canal, in my last.

The culvert, at Raub's, near Easton, originally consisting of two arches of six feet span each, was entirely destroyed by the rise of the stream upon which it was located. This has been replaced by an aqueduct of twelve feet span, thereby, affording the greatest possible opening for the stream. This was built without any extra expense for timber, the superstructure of one span of Durham creek acqueduct, being used in its construction.

The aqueduct, at Durham creek, originally two spans of twenty-five feet each, was almost entirely destroyed. The same course was deemed expedient here, as that adopted at the culvert just mentioned. The creek was crossed with a single span of fifty feet, built with arch and truss, it being here, also necessary to give the stream all the vent possible.

The aqueduct at Gallow's Run, was so injured, as to render it necessary to rebuild its pier, replace the trunk, and sink a crib on the upper side, to protect the abutment. The Tinicum aqueduct, partially injured in one of its abutments, was repaired by a buttress, and the pier under pinned, so as to be rendered secure.

The Lumberville aqueduct, required no repairs. The aqueduct at Tohickon, of four spans, of twenty-five feet each, was in a most delapidated condition. One pier had fallen, and one undermined, the abutment badly cracked, and two spans of the trunk destroyed. The first pier has been rebuilt, the next effectually underpinned, and the abutment partially repaired.

The trunk of the aqueduct at New Hope, was found upon examination to be entirely decayed, which was replaced, previous to the admission of the water. The remainder of the aqueducts upon the line, required so little repair, as scarcely to be worthy of notice.

As the business season, was so rapidly approaching, it was considered most prudent, to postpone the repairs of the locks, until the coming winter, in order that no delay might be occasioned, beyond that created by the most pressing necessities of the line.

The waste wiers were partially repaired, and the bridges and guard gates, put in such condition, as to be safe during the present season.

At Well's Falls the feeder suffered considerable injury. The lifting wheel was unshipped, the guards carried away, and the connection between the end of the dam, and the flume wall wholly forced out. At this period of distress, the Mauch Chunk and Beaver Meadow Companies, offered their assistance; the first mentioned immediately sent one hundred and thirty men on the line; and the latter, proposed to furnish eighty more. The difficulty of obtaining boarding on the line, prevented the acceptance of their offer.

The prism of the canal, had become in many places filled to a great extent, by the wash from the side hills, and banks, which had not been latterly removed. This rendered it necessary to have a level run throughout the line, and the excavation finished, in order to give the full depth of water previous to opening the canal. This caused the greatest delay, which attention on the part of the former supervisors would have rendered unnecessary.

The canal from New Hope to Bristol, was ready for operation, on the 24th of March, and the feeding wheels started; and on the 28th, the navigation was fairly resumed. The repairs on that portion between New Hope and Easton, were not completed before the 29th of April, and navigation fully commenced on the 13th of May. At the period of the last freshet, (8th April,) the repairs had been advancing rapidly, and would, in all probability, have admitted the trade by the 25th of the same month, had not the works been subjected to a second demolition, which retarded their completion until the time above specified.

The duties of the supervisors upon this division, have been arduous and perplexing. Public confidence, joined to their business habits, has alone enabled them to carry on their work, in most instances upon extended credit, and invariably depressed for want of funds.

The navigation throughout the season, has been interrupted occasionally by leaks of light character, but principally from a breach which took place on the 10th of August, at Heinlein's, about three miles below Easton. This was caused by the original malformation of the canal, at that point. An exposed side hill, and the water deep, a foundation was raised of rough material, composed of stumps and rocks, through which a light coating of good lining gradually filtrated, and undermined the entire bank. A slight leak was observed, and during the process of repair, the sudden irruption took place, carrying the repair boat into the breach, and crushing it to pieces. This point having been properly sheet-piled, and a dam thrown across the canal above, gravel was boated and the whole effectually repaired, since which no interruption has taken place. The width of the water line

of this canal, is forty feet, the depth five, and the width at bottom twenty-five feet.

The rebuilding of the lock at Erwinna, has been contempleted, it having originally been built six inches narrower than the balance on the line, in the adoption of a statement for the locks on this division, a size corresponding with those upon the Eastern Division of the Susquehanna, viz. seventeen by ninety would be preferable, as a proportion well adapted for transportion purposes, and being applicable to the capabilities of this division, the capacity of which can readily be increased to correspond.

The Guard Lock, at Easton, is constructed so as to secure the canal against a rise of ten feet above the comb of the dam. The bottom of the outlet lock, communicating with the Delaware, is sixteen feet below the top water line of canal, and four feet four inches below low water mark in the Delaware; the gates rising twenty-two feet two inches above low water mark.

The old dam across the Lehigh is three hundred and seventeen feet in length, measured on the comb between the abutments. It is built of crib work filled with stone, and covered with poles and gravelled, having an upper slope of three feet base to one foot rise, and a lower slope of one and a half feet base to one foot rise. The new dam will be similarly constructed, but will be three hundred and thirty feet between the abutments, having an upper slope of three to one, and a lower of two to one; this will prevent the undermining experienced in the old structure. It is to be covered with white oak sawed timber bolted and anchored to the crib work below. The intermediate space between the old and new dams, will be filled with gravel and stone, and the lower slope extended to low water mark. The abutments to be built of hammer dressed range work of the best character, laid in cement and crossed.

There are upon this line nine aqueducts, twenty culverts, nineteen waste weirs and one hundred and five bridges. The abutments and piers of the aqueducts are of rubble masonry laid in cement, and the superstructure of wood; the trunks are twenty-one feet wide in the clear at top, twenty at bottom, and five feet deep. The bridge abutments are of dry masonry, and will require much repair during the coming season. The superstructures are single spans of fifty feet in length.

The Basin at Bristol will require an additional wharf, and a pier projecting fifty feet into the Delaware, to afford facilities for loading vessels of heavy tonnage. It covers an area of five and a half acres, and is enclosed on two sides by piers formed of crib work and filled with earth. The pier on the south east side, is five hundred feet long, forty feet wide, and raised nine feet three inches above common low tide; that, on the south west side, including the length of the tide lock, and extending to the foot of lift lock No. 1, is one thousand and eighty-nine feet long, twenty feet wide on top, and raised to a corresponding height. The improvement proposed will consist of an additional wharf or dock, in the interior of the basin on the Bristol side,

which can be made a profitable investment, such offers having been made for its occupancy as to render it worthy of attention.

The limestone trade upon this canal has become of great importance, a vast number of tons having been transported during the past year. It presents itself upon the Delaware, immediately in the vicinity of Easton, again at Durham Creek and near New Hope. An excellent sand stone is found near Yardleyville, which can be used with great advantage in the projected improvements. This being the only quarry upon the line, of that quality, the undersigned would suggest the propriety of securing it to the commonwealth in order to preserve it for future necessities.

The Lehigh company have extended their navigation twenty-six miles above Mauch Chunk, which is of permanent and effective character. By it, numerous companies concerned in the vast Coal and Pine regions are enabled to find a market, for their so long excluded productions, which added to the increasing amount of merchandize transported, will serve to swell the tolls upon this division and rank it among the most productive improvements of the commonwealth, having during the past year, under all the disadvantageous circumstances of a late opening, and twenty-seven days interruption of the navigation, paid six per cent interest upon its entire cost, which has been, inclusive of repairs since completed, one million six hundred thousand dollars.

After calculating the tonnage which may be anticipated from the Railway now in progress between the Lehigh and the Susquehanna, the Catawissa road, and the coal companies at present in partial operation, the amouut of business will be found to be such, as to create the absolute necessity of enlarging the locks, and increasing the whole capacity of the canal. For this purpose a liberal annual appropriation should be made.

I cannot close the report upon this division, without reference to the indefatigable exertions of the Principal Assistant Engineer, Mr. Martin Corryell, to whose zeal and attention much credit is due, in effecting the early admission of the water last spring, after such an unparalleld scene of disasters.

Subjoined is a condensed estimate of repairs, the principal partof which will be required to be completed, during the coming winter, in order to retain uninterrupted the navigation of this disvision throughout the ensuing season. The detailed estimates on which, are contained in the tabular statements lately transmitted.

Repairs of wharf at Bristol, to be planked and piled,		$2,000 00
Tide lock, new gates, and locks No. 1, 2 and 3, replanked,		2,931 76
Locks No. 4, 5, 6 and 7 replanked and studded,		3,149 00
Guard and combined locks No. 10 & 11, planked and studded,		2,222 55
Locks No. 12, 13, 14, 15 and 16, " "		2,528 14
" 17, 19, 20 & 21 coped, planked, studded & gates,		5,430 16
" 22 and 23 " "		2,565 07
Waste wier at Beaumont's rebuilt,	$1,114 27	
" Union mills "	608 86	
" Centre bridge "	596 36	
" near Bucks "	393 50	
" below lock No. 18, "	371 00	
" at Morrisville "	532 59	
" near lock, No. 6, "	358 23	
" at Rocky Falls, "	819 33	
		4,794 08
Superstructure of two bridges near Tyburn,		380 77
Repairs of abutments of bridges on line,		1,560 00
" aqueduct at Yardlyville,		1,037 88
Dam at Tohickon,		350 00
" at Hough's creek,		1,433 76
Aqueduct at Knowle's creek to be widened to 35 feet,		3,436 50
Tohickon abutment to be repaired,		675 00
Works at Easton, repairs of,		5,180 00
Pine timber for superstructure,		4,567 91
Hemlock timber and plank,		2,262 21
Dam at Easton,		28,021 00
Pier in Delaware and new wharf at Bristol,		3,500 00
Raising towing path banks, and repairs of wall on line,		15,000 00
Ordinary repairs of banks, tools, &c.		18,000 00
Total amount,		$111,025 79

RECAPITULATION.

Repairs of locks,	$20,826 68	
Waste weirs,	4,794 08	
Bridges,	1,940 77	
Dams,	29,804 76	
Aqueducts,	5,149 38	
Weigh lock, feeder, &c. at Easton,	5,180 00	
Timber,	6,830 12	
Pier at Bristol, wharf, &c.	3,500 00	
Raising banks and repairs to wall,	15,000 00	
Ordinary repairs of banks, tools, &c.	18,000 00	
	111,025 79	
Contingencies and supervision, 10 pr. ct.	11,102 57	
		$122,128 36

Respectfully submitted.

W. K. HUFFNAGLE, *Engineer.*

[No. 17.]

Report of A. B. Warford, Engineer.

WISCONISCO CANAL.

ENGINEER'S DEPARTMENT, WISCONISCO CANAL,
November 28th, 1839.

To the Board of Canal Commissioners.

GENTLEMEN:—The following report on the Wisconisco Canal is submitted by the Engineer.

REPORT.

The Wisconisco Canal is twelve and one fourth miles long. It commences at the Wisconisco Creek at the western end of the Lykens Valley rail road, near Millersburg, and terminates in the pool of the Clark's Ferry dam, at the bridge across the Susquehanna at that place. It has one dam, (across the Wisconisco Creek,) one guard lock, six lift locks, amounting to thirty-five feet of lockage; three aqueducts, two culverts, five waste weirs, eighteen bridges, five water ways, and six lock houses. The principal part of the work was put under contract in August 1838. It is now all under contract with the exception of one bridge, five water ways and some fencing.

Section No. 6 is completed but not paid off. Section No. 5 is nearly completed. Sections Nos. 7, 13, 18 and 23 are more than three-fourths done. Section No. 15 is about three-fourths done. Nos. 3, 4, 10, 11, 12, 19 and 20, about two-thirds done. Nos. 2, 17 and 21, are about one half done. No. 25 is about one-third done. Nos. 8, 9, 14, 16, 22 and 24, are about one-fourth done, and No. 1 is commenced. The abutments of the dam have been commenced, and the guard lock is nearly completed. The pit for lock No. 5 is nearly excavated, and the pits for Nos. 2 and 4 have been commenced. The masonry of the aqueduct over Powel's Creek, has been carried up as high as the springing lines of the arches, and one of the arches have been closed. Culvert No. 7, at Halifax, is nearly completed.

The dam is to be constructed of timbers laid up in the form of crib work and filled with stones—to be covered with six inch plank and to have stone abutments.

The locks are to be of the description commonly called composite locks, that is, they are to have stone breast and side walls laid in mortar and jointed, and the face of them lined with wood.

The aqueducts are to be built of stone and the channel through them to correspond in dimensions with the main part of the canal.

The culverts are also to be built of stone.

The bridges are to be forty-nine feet span, and to have stone abutments and wooden superstructure.

Appended hereto is an estimate of the whole cost of constructing the canal, amounting to $376,195 43; also, a statement shewing the estimated amount of work done to November 1, 1839, namely $127,216 49, and the estimated amount required to finish it, being $248,978 94.

Owing to the small sum of money applicable monthly to this division of the state improvements, but a small amount of work has been done during the past season. The work is generally in the hands of energetic men who would prosecute it rapidly to completion, provided there were means to pay them. On the estimate made the first instant they will not be able to obtain more than about three per cent. of the amount.

The time of completing the work will of course depend upon the time when means are furnished to pay the contractors. Should funds sufficient be provided, it may be completed by the next fall, and when completed will be a source of great revenue to the state from the tolls arising from the transportation of the coal in which Lykens Valley abounds, and not only from the tolls arising from the transportation of coal upon its own waters, but also, from the increased tonnage thrown upon other improvements of the state.

The following is the estimated cost of the Wisconisco Canal, viz:

SECTIONS.

Section No. 1, *Bernard Flynn.*

Grubbing,				$250 00	
15,245	Cubic yds.	com. excavation at	12	1,829 40	
5,400	do	hardpan	26	1 404 00	
2,000	do	detached rock	29	580 00	
2,100	do	embankment	14	294 00	
2,000	do	rip rap	75	1,500 00	
					$5,857 40

Section No. 2, *A. W. Leyburn.*

Grubbing,				$200 00	
17,660	Cubic yds.	com. excavation, at	14	2,472 40	
15,300	do	embankment	18	2,754 00	
3,592	do	solid rock	60	2,155 20	
10,029	do	detached rock	30	3,008 70	
8,090	Perches	vertical wall	$1 25	10,112 50	
2,000	do	slope wall	87½	1,750 00	
300	do	rip rap	30	90 00	
					$22,542 89

Section No. 3, *James Freeland and Joel Baily.*

Grubbing.				$800 00	
14,900	Cubic yds.	com. excavation	10	1,490 00	
23,230	do	embankment	14	3,252 20	
500	do	solid rock	56	280 00	
1,200	do	detached rock	30	360 00	
1,140	Perches	vertical wall	$1 30	1,482 00	
3,000	do	slope wall	87½	2,625 00	
1,000	do	rip rap	50	500 00	
					$10,689 20

Section No. 4, A. M'Coy and James Bauman.

Grubbing,				$200 00	
14,280	Cubic yds.	com. excavation at	10	1,428 60	
5,000	do	embankment	10	500 00	
150	do	solid rock	50	75 00	
1,650	do	detached rock	25	412 50	
900	perches	slope wall	$1 00	900 00	
Removing and rebuilding fence,				27 00	
					$3,542 50

Section No. 5, William Freeland and Calvin Holmes.

Grubbing,				$240 00	
10,228	Cubic yds.	com. excavation at	12	1,227 36	
6,790	do	embankment	13	882 70	
68	do	solid rock	54	36 72	
1,820	do	detached rock	28	509 60	
					$2,896 38

Section No. 6. James Black and Henry Shaltz.

6,864	Cubic yds.	com. excavation at	13	892 32	
9,244	do	embankment	16	1,479 04	
17	do	solid rock	56	9 52	
465	do	detached rock	38	176 70	
350	stone removed, estimated		20	70 00	
				$2,627 58	
Add amount paid for work done by the former contractor,				5 24 60	
					$3,151 58

Section No. 7, Peter Bixler.

Grubbing,				$800 00	
15,585	Cubic yds.	com. excavation, at	12	1,870 20	
3,000	do	embankment	12	360 00	
81	do	solid rock	55	44 55	
2,990	do	detached rock	28	837 20	
200	perches inside wall		$1 00	200 00	
Culvert under bridge embankment				36 50	
					$4,148 45

Section No. 8. Samuel Rutherford & Company.

Grubbing,				$475 00	
25,800	Cubic yds.	com. excavation at	15	3,870 00	
4,200	do	embankment	13	546 00	
200	do	solid rock	50	100 00	
2,200	do	detached rock	40	880 00	
1,500	perches, rip rap		35	525 00	
					$6,796 00

Section No. 9, George O'Neil & James M'Coy.

Grubbing,				$635 00	
14,300	Cubic yds.	com. excavation at	14	2,002 00	
14,440	do	embankment,	10	1,444 00	
250	do	solid rock	60	150 00	
1,840	do	detached rock	28	515 20	
					$4,746 20

Section No. 10, John Armstrong.

Grubbing,				$120 00	
19,800	Cubic yds.	com. excavation at	15	2,970 00	
750	do	embankment,	12	90 00	
52	do	solid rock	50	16 00	
1,600	do	detached rock	27	432 00	
					$3,628 00

Section No. 11, H. B. Blanchard, & Co.

6,818	Cubic yds.	com. excavation at	16	$1,090 88	
1,600	do	embankment	18	288 00	
60	do	solid rock	50	30 00	
970	do	detached rock	40	388 00	
				$1,796 00	
Add amount estimated to former contractor and paid by former superintendent,				1,600 91	
					$3,397 79

Section No. 12, John P. Leibrick.

Grubbing,				$120 00	
20,000	Cubic yds.	com. excavation at	16	3,280 00	
8,750	do	embankment	18	1,575 00	
50	do	solid rock	62½	31 25	
1,300	do	detached rock	40	520 00	
2,200	perches	vertical wall	$1 75	3,850 00	
4,150	do	slope wall	1 25	5,187 50	
600	do	rip rap	37	222 00	
Extra work, bridge road and fence,				112 00	
					$14,897 75

Section No. 13, John S. Dykens.

Grubbing,				$200 00	
13,434	Cubic yds.	com, excavation at	13	1,746 42	
8,549	do	embankment	16	1,367 84	
116	do	solid rock	50	58 00	
1,170	do	detached rock	31	362 70	
100	perches	inside wall	$1 00	100 00	
Extra work, removing buildings and fence, and building culvert, road bridge &c.,				352 10	
					$4,187 06

Section No. 14, *Daniel Kendrig & P. Dorid.*

Grubbing on road,				$100 00	
9,841	Cubic yds.	com. excavation at	10	984 10	
40,794	do	embankment	19	7,750 86	
2,426	do	solid rock	50	1,213 00	
750	do	detached rock,	35	262 50	
10,984	perches	vertical wall	$1 25	13,730 00	
908	do	slope wall	1 00	908 00	
630	do	rip rap	35	220 50	
117	do	wall rebuilt	50	58 50	
Removing fence,				5 00	
				$25,232 46	
Add value of work done by John Farrell,				3,026 95	
					$28,259 41

Section No. 15, *James Martin.*

Grubbing,				$450 00	
19,523	Cubic yds.	com. excavation at	10	1,952 30	
33,055	do	embankment	19	6,280 45	
75	do	solid rock	50	37 50	
3,271	do	detached rock	25	817 75	
7,086	perches	vertical wall	$1 25	8,857 50	
20	do	slope wall	80	16 00	
500	do	rip rap	28	140 00	
Bridge for road, and plank for overfalls,				170 00	
					$18,721 50

Section No. 16, *Knox, Wood & Russell.*

Grubbing,				$500 00	
26,898	Cubic yds.	com. excavation at	12½	3,362 25	
10,595	do	embankment	17	1,801 15	
2,000	do	solid rock	50	1,000 00	
8,000	do	detached rock	35	2,800 00	
3,876	perches	rip rap	35	1,356 60	
510	do	vertical wall	$1 40	714 00	
225	do	inside wall	75	168 75	
Material for overfalls				40 00	
					$11,742 75

Section No. 17, *George Blattenberger & Co.*

Grubbing,				$100 00	
25,238	Cubic yds.	com. excavation at	16	4,038 08	
6,880	do	embankment	18	1,238 40	
200	do	solid rock	50	100 00	
4,825	do	detached rock	40	1,930 00	
3,929	perches	rip rap	37	1,453 73	
				$8,860 21	
Add estimated value of work done by P. A. Martin,				2,113 52	
					$10,973 73

Section No. 18, *John Hicks & Co.*

Clearing.				$30 00	
12,472	Cubic yds.	com. excavation at	14	1,745 08	
2,910	do	embankment	14	407 40	
1,715	do	detached rock	35	600 25	
50	do	solid rock	50	25 00	
1,048	perches	rip rap	35	366 80	
Removing stone,				66 00	
				$3,241 53	
Estimated value of work done by Johnson & Co.				802 56	
					$4,044 09

Section No. 19, *Stees, Duncan & Drake.*

Grubbing,				$200 00	
13,469	Cubic yds.	com. excavation at	13	1,750 97	
16,114	do	embankment	13	2,094 82	
953	do	solid rock	56	533 68	
2,473	do	detached rock	35	865 55	
3,005	perches	rip rap	50	1,502 50	
Two bridges for road, estimated,				300 00	
					$7,247 52

Section No. 20, *Galbraith & Fleming.*

Grubbing,				$520 00	
34,893	Cubic yds.	com. excavation at	11	3,838 28	
10,270	do	embankment	13	1,335 10	
2,500	do	solid rock	68	1,700 00	
750	do	detached rock	31	232 50	
30,209	perches	rip rap	45	1,444 05	
190	do	slope wall	65	123 50	
Bridge for road and removing fence,				103 00	
					$9,296 38

Section No. 21, John Holland & David M'Coy.

Grubbing,				$1,000 00	
19,800	Cubic yds.	com. excavation at	15	2,970 00	
1,686	do	embankment	10	168 60	
110	do	solid rock	58	63 80	
800	do	detached rock	29	232 00	
750	perches	rip rap	45	337 50	
Culvert for road, read and fence,				114 00	
					$4,885 90

Secteon No. 22, J. R. & S. Shoemaker, & J. Bowman.

Grubbing,				$240 00	
15,250	Cubic yds.	com. excavation at	13	1,982 50	
6,704	do	embankment	16	1,072 64	
80	do	solid rock	50	40 00	
3,833	do	detached rock	38	1,456 54	
Removing fence,				84 00	
					$4,875 68

Section No. 23, John Walborn & Co.

Grubbing,				$25 00	
13,335	Cubic yds.	com. excavation at	15	2,000 25	
2,145	do	embankment	16	343 20	
175	do	solid rock	48	84 00	
2,359	do	detached rock	35	825 65	
				$3,278 10	
Estimated amount of work done by G. Etter, former contractor,				676 02	
					$3,954 12

Section No. 24. George W. Etter, & Co.

Grubbing,				$400 00	
14,944	cubic yds.	com. excavation, at	12	1,793 28	
12,380	do	embankment	16	1,980 80	
1,500	do	solid rock	48	720 00	
3,620	do	detached rock	27	977 40	
4,850	do	rip rap	35	1,697 50	
					$7,568 98

Section No. 25. William Cameron

Grubbing,			$75 00	
26,093 cubic yds.	com. excavation at	16	4,174 88	
10,500 do	embankment	17	1,785 00	
2,000 do	solid rock	50	1,000 00	
9,360 do	detached rock	37½	3,510 00	
2,240 perches	slope wall	$1 25	2,800 00	
5,047 do	rip rap	35	1,766 45	
			$15,111 33	
Estimated value of work done by Jones,			2,988 30	
				$18,099 63
Total estimated cost of sections,				$220,150 80

Dam across Wiconisco creek. Geo. Blattenberger.

1,200 cubic yds.	excava. foundation at	60	$720 06	
2,000 do	embankment	30	600 00	
1,800 do	grubbing	50	900 00	
750 prs.	masonry in abutments	$3 75	2.812 50	
300 "	protection wall on emb.	1 50	450 00	
170 lineal feet	weir of dam,	18 00	3,060 00	
				8,542 50

Guard Lock. Frick & Wagle

Grubbing,			$30 00	
2,075 cubic yds.	excavation of pit at	33	684 75	
1,400 do	canal excavation	33	462 00	
1,200 do	embankment	20	240 00	
1,440 perches	masonry		4,896 00	
20,663 lbs.	Iron in lock walls, &c.	9	1,859 67	
400 prs.	slope wall below lock	1 50	600 00	
Carpentry pr. contract			1,400 00	
Add for extra materials and workmanship,			1,000 00	
				$11,172 42

Lock No. 1. John P. Schuyler.

1,000 cubic yds.	excavation of pit at	25	$250 00	
1,200 do.	embankment	30	360 00	
200 do	canal excavation	13	26 00	
400 do	do embankment	15	60 00	
200 do	puddling	40	80 00	
842 perches	masonry	$3 75	3,157 50	
120 do	wall below lock	1 50	180 00	
4,300 lbs	wall iron bolts, &c.	12½	537 50	
Carpentry complete, including materials,			1,169 50	
				$5,820 50

Lock No. 2. Wm. P. & S. Brady.

1,000	cubic yds. excavation of pit at	20	$200 00	
2,000	do embankment	20	400 00	
250	do canal excavation	12½	31 25	
1,000	do do embankment	17	170 00	
815	perches masonry	$3 62½	2,954 37	
120	do. wall below lock	1 00	120 00	
4,300	lbs. iron, bolts, clamps, &c.	10	430 00	
200	cubic yds. puddling	50	100 00	
Carpentry, including materials,			1,350 00	
				$5,755 62

Lock No. 3. Ellis Updegrove, & Co.

1,150	cubic yds com. excavation, at	20	$230 00	
400	do detached rock	40	160 00	
200	do solid rock	80	160 00	
2,200	do embankment	18	396 00	
200	do puddling	50	100 00	
870	perches masonry	$3 25	2,827 50	
120	do below lock	1 00	120 00	
4,300	lbs Iron bars, bolts, &c.	10	430 00	
Carpentry complete			1,350 00	
Grubbing			100 00	
				$5,873 50

Lock No. 4. William Welker.

1,109	cubic yds. com. excavation at	20	$221 80	
300	do detached rock	37	111 00	
650	do solid rock	70	455 00	
400	do com. exc. canal	12	48 00	
200	do det. rock do	27	54 00	
1,000	do embankment	25	250 00	
200	do puddling	40	80 00	
870	perches masonry	$3 25	2,827 50	
120	do wall below lock	1 00	120 00	
4,300	lbs Iron bars, bolts, &c.	8½	365 50	
Carpentry complete			1,400 00	
				$5,932 80

Lock No. 5. Franklin Wright & J. Fertig.

2,850	cubic yds. excavation of pit at	25	$712 50	
650	do com. exc. of canal	16	104 00	
150	do det. rock do	37½	56 25	
1,200	do embankment	25	300 00	
200	do puddling	50	100 00	
870	perches masonry	$3 75	3,262 50	
120	do s. wall below lock	1 00	120 00	
4,300	lbs Iron bars, bolts, &c.	10	430 00	
Carpentry complete,			925 00	
				$6,010 25

Lock No. 6. R. H. Jones.

1,630	cubic yds. excavation, at	65	$1,059 50	
1,500	do embankment	35	525 00	
842	perches masonry	$3 00	2,526 00	
4,300	lbs. Iron, bars, &c.	10	430 00	
200	cubic yds. puddling	50	100 00	
Carpentry including materials,			1,500 00	
				$6,140 50
Total estimated cost of locks,.....				$46.578 79

AQUEDUCTS.

Aqueduct No. 1, Abner Rutherford.

1,500	Cubic yds. excavation at	25	$375 00	
1,500	do embk't	25	375 00	
1,534	Perches masonry	$5 00	7,670 00	
70	feet lineal of carpentry	7 00	490 00	
				$8,910 00

Aqueduct No. 2, Jackson M'Fadden and John Walls.

1,000	Cubic yds. excavation at	30	$300 00	
3,000	do embk't.	60	1,800 00	
1,712	Perches masonry	$3 55	7,670 00	
24,460	square feet board measure of carpentry	$15 00 per m.	366 90	
90	feet lineal railing	2 00	180 00	
200	lbs iron for clamp	12	24 00	
				$8,748 50

Aqueduct No. 3, George Mish.

2,500	Cubic yds. excavation at	50	$1,250 00
2,206	do embk't	20	440 00
2,380	Perches masonry	$5 50	13,090 00
100	feet lineal for carp'y	6 00	600 00
300	lbs iron for clamp	12½	37 50
			$15,417 50

Add amount estimated and paid to former contractors,	600 00	
		$16,017 50
Total estimated cost of Aqueducts,		$33,676 00

CULVERTS.

Culvert No. 1, *Benjamin Parke.*

950 Cubic yds. excation at	25	$237 50	
300 Perches masonry	$3 87	1,161 00	
2,100 square feet board measure carpentry	15 00 per m.	31 50	
150 Cubic yds. puddling	35	52 50	
			$1,482 50

Culvert No. 2, *Henry Isenhower.*

500 Cubic yds. com. exc'tion at	20	$100 00	
50 do detached rock	30	15 00	
223 Perches masonry	$3 00	669 00	
12,300 square feet board measure carpentry	30 00 per m.	369 00	
150 Cubic yds. puddling	35	52 50	
			$1,205 50
Total estimated cost of Culverts,			$2,688 00

WASTE WEIRS.

Waste Weir No. 1, *Daniel N. L. Reulter.*

300 Cubic yds. excavation at	15	$45 00	
280 do embankment	25	62 50	
100 do puddling	30	30 00	
30 Perches paving	$1 50	45 00	
20,500 square feet board measure carpentry	15 00 per m.	307 50	
			$490 00

Waste Weir No. 2, Collins & Wilt.

300 Cubic yds. excavation at		19	$57 00	
250 do embankment		18	45 00	
100 do puddling		30	30 00	
30 Perches paving	$1 50		45 00	
20,500 square feet board measure carpentry	15	25 per m.	312 62½	
100 lbs. iron		12	12 00	
				$501 62½

Waste Weir No. 3, Collins & Wilt.

300 Cubic yds. excavation at		19	$57 00	
250 do embankment		18	45 00	
100 do puddling		30	30 00	
30 Perches paving	$1 50		45 00	
20,500 square feet board measure carpentry	15	25 per m.	312 62½	
100 lbs. iron		12	12 00	
				$501 62½

Waste Weir No 4, Henry Sprigman.

300 Cubic yds. excavation at		25	$75 00	
250 do embankment		17	42 50	
100 do puddling		30	30 00	
30 Perches paving	$1 50		45 00	
20,500 square feet board measure carpentry	14	50 per m.	297 25	
				$489 75

Waste Weir No. 5, Henry Sprigman.

300 Cubic yds. excavation at		25	$75 00	
250 do embankment		17	42 50	
100 do puddling		30	30 00	
30 Perches paving	$1 50		45 00	
20,500 square feet board measure carpentry	14	50	297 25	
				$489 75

Whole estimated cost of Waste Weirs, $2,472 75

BRIDGES.

Bridge No. 1, Patterson & Bousman.

100 Cubic yds. excavation at		20	$20 00	
250 do embankment		20	50 00	
160 Perches masonry	$2 25		360 00	
Carpentry per foot lineal	5	70	570 00	
				$1,000 00

Bridge No. 2, Montgomery & M'Connell.

100	Cubic yds. excavation at	20	$20 00	
1,300	do embankment	20	260 00	
235	Perches masonry	$2 05	481 75	
	Carpentry, complete, per foot lineal,	4 75	251 75	
				$1,013 50

Bridge No. 3, Montgomery & M'Connell.

150	Cubic yds. excavation at	20	$30 00	
1,400	do embankment	20	280 00	
235	Perches masonry	$2 12½	499 37	
	Carpentry, complete, per foot lineal,	4 50	238 50	
				$1,047 87

Bridge No. 4, Atherton & Dykens.

100	Cubic yds. excavation at	25	$25 00	
1,500	do embankment	31	465 00	
250	Perches masonry	$2 00	500 00	
	Carpentry, complete, per foot lineal,	6 00	318 00	
				$1,308 00

Bridge No. 5, Benjamin Hood.

100	Cubic yds. excavation at	20	$20 00	
1,700	do embankment	25	425 00	
290	Perches masonry	$3 00	870 00	
	Carpentry, complete, per foot lineal,	4 00	212 00	
				$1,527 00

Bridge No. 6. Peter Bixler.

100	cubic yds. excavation, at	13	$13 00	
1,600	do embankment	13	208 00	
280	perches masonry	$2 18¾	612 50	
	Carpentry complete pr. ft. lin.	4 50	238 50	
				$1,072 00

Bridge No. 7. S. W. Freeburn.

100	cubic yds. excavation, at	15	$15 00	
1,300	do embankment	12½	162 50	
210	perches masonry,	$3 00	630 00	
	Carpentry, pr. foot lineal	7 00	371 00	
390	lbs Iron	8	31 20	
				$1,209 70

Bridge No. 8. Fleming & Galbraith.

100 cubic yds. excavation, at	20	$20 00	
1,100 do embankment	20	220 00	
185 perches masonry	$2 50	462 50	
Carpentry complete, pr. ft. lin.	7 50	397 50	
			$1,100 00

Bridge No. 9. Jas. Dunn, Shoemaker, & Co.

100 cubic yds. excavation, at	20	$20 00	
1,100 do embankment	20	220 00	
185 perches masonry	$2 25	416 25	
Carpentry complete, pr. ft. lin.	5 00	265 00	
390 lbs. Iron	13	50 70	
			$971 95

Bridge No. 10. John Armstrong.

120 cubic yds. excavation, at	20	$24 00	
2,800 do embankment	20	560 00	
264 perches masonry	2 50	660 00	
Carpentry complete, pr. ft. lin.	4 00	212 00	
			$1,456 00

Bridge No. 11. John Armstrong.

150 cubic yds. excavation, at	20	$30 00	
2,000 do. embankment	20	400 00	
235 perches masonry	2 50	587 50	
Carpentry complete per foot lineal,	4 00	212 00	
			$1,229 50

Bridge No. 12. James Black.

100 cubic yds. excavation, at	17	$17 00	
1,200 do embankment	22	264 00	
235 perches masonry	$3 55	834 25	
Carpentry complete per foot lineal	3 50	185 50	
			$1,300 75

Bridge No. 13. Jas. M. Bowes & Umberger.

100 cubic yds. excavation at	20	$20 00	
1,400 do embankment	20	280 00	
235 perches masonry	$2 25	528 75	
Carpentry complete, per foot lineal	5 70	302 10	
			$1,130 85

Bridge No. 14. Jos. M. Bowes & Umberger.

100 cubic yds. excavation, at	20	$20 00	
1,800 do embankment	20	360 00	
235 perches masonry	$2 25	528 75	
Carpentry complete per foot lineal	5 70	302 10	
			$1,210 85

Bridge No. 15. *Thomas Duncan.*

100 cubic yds. excavation, at	25	$25 00	
1,100 do embankment	30	330 00	
235 perches masonry	$2 80	658 00	
390 lbs Iron	12½	48 75	
Carpentry complete, pr. lin. ft.	6 80	360 40	
			$1,422 15

Bridge No. 16. *Andrew M'Coy.*

100 cubic yds. excavation, at	25	$25 00	
1,800 do embankment	30	540 00	
280 perches masonry	$3 00	840 00	
390 lbs. iron	12½	48 75	
Carpentry complete, pr. lin. ft.	6 00	318 00	
			$1,771 75

Bridge No. 17. *R. Benjamin & Bostic.*

100 cubic yds. excavation, at	25	$25 00	
1,300 do embankment	30	390 00	
235 perches masonry	$3 00	705 00	
390 lbs. iron	12½	48 75	
Carpentry complete pr. lin. ft.	6 25	331 25	
			$1,500 00

Bridge at Clark's Ferry—Not under contract.

3,000 Cubic yds excavation at	50	$1,500 00	
1,100 perches masonry,	$5 00	5,500 00	
350 do do	2 50	875 00	
700 Cubic yds. embankment	25	175 00	
Temporary bridge and repairing old work,		500 00	
			$8,550 00
Total estimated cost of bridges,			$29,921 87

LOCK HOUSES.

Lock House, No. 1, *Frank & Hackert.*

110 Cubic yards excavation at	9	$9 90	
Materials and workmanship,		375 00	
			$384 90

Lock House, No. 2, *Frank & Hackert.*

Estimated cost of repairing old house,	$200 00

Lock House, No. 3, *Reifsnyder & Fortney.*

110 Cubic yards excavation at	20	$22 00	
Materials and workmanship,		460 00	
			$482 00

Lock House, No. 4, Reifsnyder & Fortney.

110 Cubic yards excavation at	20	$22 00	
Materials and workmanship,		460 00	
			$482 00

Lock House, No. 5, Crane & Rhineheart.

110 Cubic yards excavation at	20	$22 00	
Materials and workmanship,		460 00	
			$482 00

Lock House, No. 6, Crane & Rhineheart.

110 Cubic yards excavation at	20	$22 00	
Materials and workmanship,		460 00	
			$482 00
Total estimated cost of Lock Houses,			$2,512 90

MISCELLANEOUS ITEMS.

Furnishing castings, Alexander Graydon,			$1,277 00
Furnishing wrought iron, John Fertig,			1,078 00
Removing Buildings.			
From Section	7,	James M. Bowes,	160 00
do	8,	Philip Boyer,	700 00
do	13,	John S. Dykens,	150 00
do	24,	William Reed,	60 00
Five water ways around locks, not under contract,			3,000 00
Fencing along canal,		do do	2,000 00
Mill race Fox's mill, George Schriver,			100 00
			$8,525 00

Recapitulation.

Estimated cost of sections,		$220,150 80
do	Wisconisco dam,	8,542 50
do	Locks,	46,705 59
do	Aqueducts,	33,676 00
do	Culverts,	2,688 00
do	Waste weirs,	2,472 75
do	Bridges,	29,921 89
do	Lock houses,	2,512 90
do	Miscellaneous items,	8,525 00
do	Contingencies,	21,000 00
Total estimated cost,		$376,195 43

Statement showing the amount of work done on each contract, up to November 1, 1839, and the amount required to finish it.

SECTIONS.

	Amount of work done.	Amount required to finish.
Section No. 1,	$552 27	$5,304 83
do 2,	10,077 55	12,465 25
do 3,	7,028 58	3,660 62
do 4,	2,223 45	1,319 05
do 5,	2,617 03	279 35
do 6,	3,151 58	
do 7,	3,657 68	490 77
do 8,	1,509 52	5,291 48
do 9,	1,372 52	3,373 68
do 10,	2,475 54	1,152 46
do 11,	2,213 21	1,184 58
do 12,	8,431 58	6,466 17
do 13,	3,552 12	634 94
do 14,	8,813 23	19,446 18
do 15,	13,919 46	4,802 04
do 16,	3,351 94	8,390 81
do 17,	6,242 92	4,730 81
do 18,	2,681 44	1,362 65
do 19,	5,333 39	1,914 13
do 20,	6,564 94	2,731 44
do 21,	2,477 70	2,408 20
do 22,	1,204 88	3,670 80
do 23,	2,980 24	973 88
do 24,	1,576 39	5,992 59
do 25,	5,397 18	12,702 45
	$109,401 64	$110,749 16

LOCKS.

	Amount of work done.	Amount required to finish.
Guard Lock,	$8,800 00	$2,372 42
Lock No. 1,		5,820 50
" 2,	151 80	5,603 02
" 3,		5,873 50
" 4,	339 80	5,593 00
" 5,	918 34	5,091 91
" 6,		6,140 50
	$10,209 94	$36,495 85

WISCONISCO DAM.

Amount of work done.	Amount required to finish.
$615 15	$7,927 35

AQUEDUCTS.

	Amount of work done.	Amount required to finish.
Aqueduct No. 1,		$8,910 00
" 2,		8,748 50
" 3,	$4,052 50	11,965 00
	$4,052 50	$29,623 50

CULVERTS.

	Amount of work done.	Amount required to finish.
Culvert No. 1,	$729 16	$753 34
" 2,		1,205 50
	$729 16	$1,958 84

WASTE WEIRS.

	Amount of work done.	Amount required to finish.
Waste Weir No. 1,	$000 00	$490 00
" 2,		501 62½
" 3,		501 62½
" 4,		489 75
" 5,		489 75
	$000 00	

BRIDGES.

	Amount of work done.	Amount required to finish.
Bridge No. 1,	$000 00	$1,000 00
" 2,		1,013 50
" 3,		1,047 87
" 4,		1,308 00
" 5,	81 10	1,445 90
" 6,		1,072 00
" 7,		1,209 70
" 8,		1,100 00
" 9,		971 95
" 10,		1,456 00
" 11,		1,229 50
" 12,		1,300 75
" 13,		1,130 85

BRIDGES.

" 14,		1,210 85
" 15,		1,422 15
" 16,		1,771 75
" 17,		1,600 00
Bridge at Clark's Ferry,		8,650 00
	$81 10	$29.840 77

LOCK HOUSES.

	Amount of work done.	Amount required to finish.
Lock House No. 1,	$000 00	$384 90
" 2,		200 00
" 3,		482 00
" 4,		482 00
" 5,		482 00
" 6,		482 00
	$000 00	$2.512 90

MISCELLANEOUS ITEMS.

	Amount of work done.	Amount required to complete.
Furnishing castings	$1,277 00	$000 00
do wrought iron		1,078 00
Removing buildings	770 00	300 00
Water ways		3,000 00
Fencing		2,000 00
Mill race	80 00	20 00
	$2,127 00	$6,398 00

RECAPITULATION.

	Amount of work done.	Amount required to finish.
Sections	$109,401 64	$110,749 16
Locks	10,209 94	36,495 65
Dam	615 15	7,927 07
Aqueducts	4,052 50	29,623 50
Culverts	729 16	1,958 84
Bridges	81 10	29.840 77
Waste weirs		2,472 75
Lock houses		2.512 90
Miscellaneous	2,127 00	6,398 00
Contingencies		21,000 00
	$127,216 49	$248,978 94

A. B. WARFORD, *Engineer, Wisconisco Canal*

[No. 19—20.]

Report of A. B. Warford, Engineer.

SUSQUEHANNA AND NORTH BRANCH DIVISION.

ENGINEERS OFFICE, Northumberland, Nov. 23, 1839,

To the Board of Canal Commissioners.

GENTLEMEN:—

On the 4th of March, last. the undersigned, had the honor of reporting to the Board amongst other things, the condition of the work on the NorthBranch and Susquehanna division of the Pennsylvania canals, the repairs required and the cost of such repair.

At the time of making the report the amount stated, was considered by some much larger then was necessary, but subsequent examinations have convinced me that it was under, rather than over the actual amount required.

On the 29th of August last proposals were revceived by the supervisors for rebuilding the locks on the North Branch Division, between the Nanticoke dam and Northumberland; for rebuilding the aqueduct at Mill creek and Lodge run; for constructing a substantial towing path along the pool of the Nanticoke dam; also at different periods during the summer, for rebuilding all of the defective bridges on the line. Contracts have been entered into for most of the jobs, but the season had advanced so far before they were let, that but a small amount of work has yet been done. The constant low stages of water in the river, has prevented the contractors from delivering their timber, and unless there should soon be a rise, I am apprehensive that it will to a great degree retard the progress of the work. The supervisors have during the last summer done much with their own men towards perfecting the canal. The locks in many places have been repaired, and strengthened, and the canal cleaned out; the bridges and locks have required constant repair.

Last spring the floods carried away or materially injured, nearly the whole of the dam across the Lackawanna creek, which feeds about fourteen and a half miles of the upper end of the completed part of the North branch division. Since that time, a supply of water has been furnished by means of a temporary brush dam. My report to the board dated May 14th on this subject will explain more fully the state of the matter, and to which I beg the board to refer. In pursuance of a resolution of the board, dated May, 18, 1839, proposals were received on the 13th of July last, for erecting a new dam on another and better site, but the work was never allotted.

Because the work already under contract, and the erection of a new dam, much remains to be done, to perfect the canal, the most important of which, are a towing path bridge across the Nanticoke pool, instead of the tedious and unsafe ferry. A guard lock at

Henlock creek, to protect the canal below, in time of floods; about one mile of protection wall below Berwick; deepening about five miles of the lowest end of the first level below the Nanticoke dam, and increasing the breadth of the guard gates, or making water ways around them. An entire new weigh scale, with the exception of the cradle will be required at the weigh lock at Northumberland, the old one having been made a complete wreck, a few days ago while the weigh-master was in the act of weighing a boat, two of the large levers were broken in several places, and the frame which supports them so much shattered, as to require the work to be made entirely new.

The following is the estimated cost of the locks under contract, viz:

Guard lock at Nanticoke dam, Green & Geddes cont'rs.		$13,823 00
Lock No. 2.	Burke & Williams,	6,518 25
do 3.	Weiser, M'Reynolds & Co.	7,578 25
do 4.	Jackson M'Fadden,	6,043 60
do 5.	Brady & Baldy,	7,408 00
do 6.	Brady & Baldy,	7,275 50
do 7.	Burr & Harrington,	8,810 25
		$57,456 85

No estimates have been made for work done on the locks, but the contractors have commenced Nos. 2, 3, 5, 6, and 7.

Estimated cost of repairing aqueduct, over Lodges run,
Forsyth, Horton & Trescot, contractors, $7,976 75

The work is commenced repairing Nanticoke dam.
Brees, Jenkin & Wingard, contractors,

Estimated cost,	$5,362 89
Amount paid,	2,700 00
	$2,662 89

Rebuilding schute, at Nanticoke dam, Thomas Parsons, contractor.
Estimated cost, $4,376 20

Estimated cost of towing path sections.

Section No. 1.	Samuel Caldwell,	$3,696 75
do 2.	Murdock & Eldridge,	4,177 00
do 3.	Colt, Brobst, & Co.	4,091 12
do 4.	John Dougherty,	3,885 00
do 5.	John Bucher,	4,249 00
do 6.	Colt, Brobst, & Co.	5,027 37
do 7.	Henry Webb,	4,139 00
do 8.	George Weiser, & Co.	3,544 00
		$32,809 24

Estimated cost of rebuilding bridges. Estimated amount done and estimated amount required to finish.

No.	Contractors names.	Estimated cost.	Amount due.	Amt. required to finish.
24	John Edgar, & Co.	$950 75	$340 00	$610 75
42	Trescott & Dodson,	443 49		443 49
43	Crary & Brothers,	199 86		199 86
44	Muchler & Co.	320 75		320 75
45	Trescott & Dodson,	159 00		159 00
47	Muchler & Co.	555 41	57 00	498 41
48	John Rhoads & Co.	498 60		498 60
51	Crary & Brothers,	389 65		389 65
52	John Rhoads & Co.	116 60	45 00	71 60
53	John Rhoads & Co.	530 65	150 00	380 65
54	Crary & Brothers,	503 78	56 00	447 78
55	Hudson Owens & Co.	637 68	56 00	581 68
56	Crary & Brothers,	612 38		612 38
58	Hudson Owens & Co.	637 68	150 00	487 68
59	Hudson Owens & Co.	637 68	90 00	547 68
60	Hudson Owens & Co.	637 68	120 00	517 68
61	Hudson Owens & Co.	637 68	162 00	475 68
63	John Trees,	641 88		641 88
64½	John Trees,	601 54	113 00	488 54
65	D. A. Bowman,	646 63		646 63
66	Mahlen & Hicks,	306 07		306 07
67	Sponeberger & Co.	519 28	35 00	484 28
68	Snyder & Thompson,	198 75		198 75
69	John Knor,	216 24		216 24
70	Sponeberger & Co.	116 60	75 00	41 60
72	John Webb,	205 27		205 27
73	Hudson Owens & Co.	637 68		637 68
74	Sponeberger & Co.	$519 28	$00 00	$519 28
75	Enoch Crevling,	651 60		651 60
76	Ellis Hugh, & Co.	338 50		338 50
77	Sponeberger & Co.,	520 28		520 28
78	Ellis Hughs & Co.,	633 83	50 00	583 83
79	Ellis Hughs & Co.,	238 50		238 50
81	Ellis Hughs & Co.,	668 23		668 23
82	Webb & Doebler,	688 72	93 00	595 72
83	Webb & Doebler,	654 34	100 00	554 34
84	Webb & Doebler,	654 34		654 34
85	Isaac Monroe,	530 25	90 00	540 25
86	Isaac Monroe,	212 00		212 00
88	Isaac Monroe,	673 08	131 00	542 08
89	Isaac Monroe,	627 48	144 00	483 48
91	Isaac Monroe,	627 48	87 00	540 48
93	James Cornelison & Co.,	619 41		619 41
94	James Cornelison & Co.,	619 41		619 41
95	James Cornelison & Co.,	176 49		176 94

No.	Contractors names.	Estimated cost.	Amount due.	Amt. required to finish.
95	M. Macalister & Co.,	422 32		422 32
98	James Cornelison & Co.,	176 49		176 49
98	M. Macalister & Co.,	422 32		422 32
99	James Donaldson,	597 68		597 68
102	James Cornelison & Co.,	176 49		176 49
102	M. Macalister,	209 50	130 00	79 50
103	James Donaldson,	212 00		212 00
104	Steinman & Bilmyer,	612 31		612 31
105	Steinman & Bilmyer,	450 31		450 31
106	Steinman & Bilmyer,	612 31	125 00	487 31
107	James Donaldson,	605 16	62 00	543 16
108	Steinman & Bilmyer,	512 31	95 00	517 31
109	Steinman & Bilmyer,	612 31	140 00	472 31
110	Wilber & Brockway,	600 57		600 57
111	Wilber & Brockway,	600 75		600 75
112	Cook & Loke,	622 83	60 00	562 93
113	Cook & Loke,	622 93	60 00	562 93
114	Cook & Loke,	622 93	100 00	522 93
115	Cook & Loke,	622 93	70 00	552 93
116	Wilber & Brockway,	605 17		605 17
117	James Hilborn & Co.,	647 24		647 24
118	James Hilborn & Co.,	647 24		647 24
119	James Hilborn & Co.,	647 24	50 00	597 24
120	James Hilborn & Co.,	647 24		647 24
		$34,921 16	$3,036 00	$31,885 16

Estimated cost of work done under contract.

Aqueduct at Mill Creek,	$11,500 00
Guard Lock at Henlock Creek,	7,900 00
Lock No. 1,	8,930 00
Castings,	750 00
Guard Gates,	3,550 00
Bridge across Nanticoke pool,	35,900 00
Building and rebuilding wall,	13,500 00
Repairing weigh lock at Northumberland,	2,000 00
Renewing waste weirs,	1,500 00
Renewing water ways,	3,500 00
Deepening five miles of canal,	7,950 00
Ordinary repairs,	10,500 00
Rebuilding dam across Lackawanna creek,	11,700 00
	$118,280 00

RECAPITULATION,

Of the amount required to complete the repairs and perfect the North Branch Division.

Locks under contract,	$57,456 85
Aqueducts under contracts,	7,996 75
Repairs at Nanticoke dam,	2,662 89
Rebuilding schute at Nanticoke dam,	4,376 20
Towing path, sections under contract,	32,809 24
Bridges under contract,	31,885 16
	$137,167 09
Estimated cost of work not under contract,	118,280 00
Total amount required for North Branch,	$255,447 09

SUSQUEHANNA DIVISION.

In June last a contract was made with Detrick, Fisher & Co., for erecting a new aqueduct over Middle Creek on a new site, a little below the old one. It will be thirty-five feet wide, and when finished, will remedy the inconvenience at present experienced in passing boats and in the flow of water down the canal, owing to the narrowness of the old aqueduct and the abruptness of the curve at the lower end, still it will be advisable to deepen the canal between the aqueduct and the first lift lock, as recommended in my report to the Board in March last. The aqueduct is about one-fourth done.

An additional feeder from the Shamokin pool to the canal below Guard Lock has been commenced by the supervisor, which will greatly assist in supplying the canal during the dry part of the season.

The Shamokin dam has for many years been a source of expense, like many other dams in the state but little pains appears to have been taken when it was constructed to make it water tight. The water was kept up during the dry weather by the usual means of gravelling the dam and closing the schute which will in all probability, as heretofore, be washed away by the first flood. I have included in the estimate below, a sum sufficient to repair it permanently so as to avoid the annual expense of gravelling. The amount is larger than stated in my report last spring, for the the reason, that it was supposed a part of the dam had been permanently repaired during the summer of 1838, but the water was so high at the time of making the examination that I was unable to ascertain whether the work was secure or not, a portion of it, however, was carried off during the spring freshet and the present estimate includes a sufficient amount to repair it. Besides the above there are many repairs required to the locks, aqueducts, water ways, waste weirs and bridges.

In consequence of the scarcity of money the supervisor has made but few repairs, except the ordinary ones required to keep the canal in operation, the result has been that the defective works have become

worse since my first report and require a greater amount to repair them.

The following is the estimated amount required to repair the Susqehanna Division, viz:

Guard lock,	$181 00
Lock No. 1, and water way,	1,437 00
" 2, " "	1,650 00
" 3, " "	2,585 00
" 4, " "	3,226 00
" 5, " "	1,300 00
" 6, " "	1,152 00
" 7, " "	1,662 00
" 8, " "	812 00
Shamokin dam,	30,600 00
Additional feeder from Shamokin pool,	2,100 00
To complete aqueduct at Middle Creek,	18,426 00
To complete Mahontongo aqueduct,	200 00
Aqueduct at Berrys run,	120 00
Deepening canal from Middle Creek aqueduct to first lift lock,	3,500 00
Renewing and repairing bridges,	8,200 00
Rebuilding and repairing waste weirs,	4,495 00
Other repairs,	3,000 00
	$84,646 00

Aggregate amount required for each Division.

North Branch Division,	$255,447 09
Susquehanna Division,	84,646 00
	$340,093 09

A. B. WARFORD, *Engineer*,
North Branch and Susquehanna Divisions.

[No. 21.]

Report of Wm. B. Foster, Jr. Engineer.

NORTH BRANCH EXTENSION.

To the Board of Canal Commissioners.

GENTLEMEN: In compliance with the requisions of the Board, communicated through their Secretary, under date of the 30th ultimo, I have the honor to inform you, that as soon after the reception of those instructions as practicable, I prepared and submitted to the superintendents of the lines in my charge, such information as was required from the Engineer Department, to enable them to make their annual communications to the board, and in addition to the tabular statements furnished them, I respectfully submit the following report, containing a summary of the tabular statements before mentioned, with such brief remarks as suggest themselves in relation to the North Branch extension of the Pennsylvania canal.

TIOGA LINE.

That portion of the Tioga line which has been placed under contract, extending from the village of Athens to Wyalusing creek, is divided into fifty eight sections, varying in length, and making in the aggregate a distance of thirty-five miles and fifty-six chains. Thirty three miles and fifty-six chains of which is canal, and the remaining two miles towing path, along the pool of dam No. 2.

Of this description of work, seventeen sections, giving an aggregate distance of ten miles and fifty-eight chains are completed and final estimates have been returned upon them.

AQUEDUCTS.

That numbered one, over Sugar creek, has three spans of sixty-five feet each: No. 2, over Wysox creek, has three spans of sixty feet each; and No. 3 over Wyalusing creek, has three spans of seventy feet each. At all of these jobs a considerable amount of work has been done in excavating foundations, preparing materials and at each a small portion of the masonry is laid.

DAMS AND SCHUTES.

No. 1, located at the village of Athens, is designed to be nine feet in height above the plane of low water, with a length of wier of three hundred and sixty feet, and the whole distance between the abutments four hundred feet, the remaining forty feet being taken up by the schute and its outer wall.

At this work the abutments and pier head are completed, the schute in a state of great forwardness, and a considerable amount of material for the dam is prepared.

No. 2, located at Towanda, will be raised twelve feet above the low water plane, and have a wier between the E. abutment and the outer schute wall of about seven hundred and sixty feet; the space occupied by the schute being about forty feet, making the distance between the

abutments eight hundred feet. The abutments are completed and also the schute walls, together with a considerable amount of paving in the floor of the schute. The dam is extended at its full height upwards of three hundred and fifty feet from the East abutment, and is thoroughly loaded with gravel, and has an ice breaker formed of crib work to protect the end exposed to the action of the ice, so as to render it in its unfinished state as secure as the nature of the work admits.

LOCKS.

The total lockage upon the line from Athens to Wyalusing is seventy-four feet, distributed among nine locks, added to which there are four guard locks, making in all thirteen. But one of the locks, viz: No 4, has been completed; Nos. 11 and 13 are nearly completed, and at all of the others, except No. 9, some progress has been made.

CULVERTS.

Sixteen culverts in all are required upon this line, viz: one of two feet; one of three feet; two of four feet; five of six feet; two of eight feet; three of ten feet; one of twenty, and one of twenty-eight feet, chord respectively. Of the foregoing, one of four feet; three of six feet, and one of ten feet, chord are completed; and with the exception of two, some progress made with the others.

WASTE WIERS.

Seven of the nine waste wiers which will be required upon the line are under contract, and some work done upon them; none however, are yet completed.

BRIDGES.

Public and farm bridges, forty in number, were let in five lots, and at all, except lot No. 3, a considerable amount of work has been done: two of the bridges are completed, with the exception of painting, and a number of others in a state of forwardness. The raising and lengthening of the bridge over the Susquehanna, at Towanda, has been completed and the bridge in use for more than a year past, and one over Wysox creek, in lieu of one destroyed in the location and partial construction of the canal at that place, has been put under contract, and some work done in founding the abutments and laying the masonry.

For the items of fencing, roads, &c. I would respectfully refer the board to the tabular statements furnished to the superintendent.

With regard to the extensions to the State line by the Susquehanna and Chemung, as no definite location has been made, nor any arrangement concluded with the authorities of the State of New York, as to the precise points or mode of forming such connections, the details of this work cannot now be reported. In the whole estimated cost, I have adopted distances and estimates made by James D. Harris, C. E. which are presumed to be as near an approximation as can be made without an actual location. I would further remark that from a reconnaissance of part of the ground, I feel confident that the amounts estimated willbe fully adequate to the completion of those connections.

The following is a summary statement of the amount of work remaining to be done to complete the Tioga line, including the extensions to the State line:

Amount of work done up to 31st ultimo,.....		$840,270 37
Amount remaining to be done,.....		548,610 73
Add 5 pr. ct. on amount remaining to be done; Superintendent, Engineers and for contingencies, &c....		27,430 53
		$1,416,311 63
Add extension up Susquehanna,....	182,244 25	
Ditto up Chemung,.....	115,700 00	
		297,944 25
Total estimated cost of the Tioga line,.....		$1,714,255 88

TUNKHANNOCK LINE.

This line commencing at Wyalusing creek and connecting with the Wyoming line on the East side of the Lackawanna, is divided into one hundred and thirty-one sections, embracing an aggregate distance of fifty-four miles and nineteen chains; of which fifty-one miles and twenty five chains are canal and the remaing two miles and seventy-four chains towing path, along the contempated pool of dam No. 3. The heavy and most expensive sections only, are under contract, and make an aggregate distance of twenty-eight miles and twenty-eight chains. Three of them, Nos. 89, 104 and 135, are completed—whole length one mile and twenty-eight chains. The whole amount of lockage is 115½ feet, divided into fourteen locks. In addition to which, two guard locks are contemplated, one to be placed at dam No. 3, and the other at the lower end of the "Horse-shoe narrows" on section No. 117.

DAM.

There is but one dam required on the Tunkhannock line, which is designed to be built at the "Horse-race rapids." Its height above the surface of low water will be about six feet, and the length between the abutments about nine hundred feet.

AQUEDUCTS.

There will be required six aqueducts upon the whole line, as follows: one over Big Tuscarora of fifty feet span; one over Meshoppen with three spans of sixty feet each; one over Tunkhannock with three spans of seventy-five feet each; one over Butter milk falls creek with one span of thirty-four feet; one of like span over Gardener's creek; and one over Lackawanna with three spans of seventy-five feet each.

CULVERTS.

Twenty-six culverts, varying from four to twenty feet chord, will be required upon the whole line.

BRIDGES.

Of public and farm bridges, the number estimated as necessary, is sixty, and of waste weirs fourteen, together with lock houses, fencing, &c., as set forth on the tabular statement marked A., accompanying the superintendent's report.

The plans of the different mechanical structures are not yet fully designated, it is intended during the winter, to have the necessary plans completed, preparatory to the placing of this work under contract, as soon as the authority is given for that purpose.

The summary statement below, will show the amount of work done, and that remaining to be done on the 31st October 1839, on the Tunkhannock line.

Amount of work up to 31st October 1839,	$353,432 22
Amount of work remaining to be done,	1,758,558 35
Total estimated cost of Tunkhannock line,	$2,111,990 57

TIOGA AND TUNKHANNOCK LINES.

At the period of my taking charge of the work in the month of April last, a partial suspension of operations had occurred on many of the jobs, and from the scarcity of funds to meet the monthly estimate the contractors were generally permitted to make their own election of prosecuting their work or not, as their circumstances and interests might dictate. This fact will account for the comparatively small amount of work done during what might be regarded as a very favorable season for the construction of such work. The Tioga line being nearly all under contract, the estimates have been made at the present prices, with an addition of five per centum on the amount remaining to be done, to cover contingencies.

Upon the Tunkhannock line the work is estimated at the prices, so far as contracts have been made, and in other cases a liberal allowance in the quantities and value of the different items.

The mechanical work has been estimated with a view of having it constructed in the same permanent style as that upon the Tioga line; and although some deviations from those plans may be deemed advisable, and such modifications introduced as experience may suggest, it is thought that none be made whereby the cost of construction will be increased beyond the amount estimated.

The estimates of the work upon the whole line have been carefully revised, and it is believed that a very close approximation to the ultimate cost obtained. The work is in such a state of progress as to enable us to determine with a considerable degree of accuracy the quality of the material to be excavated, and care has been taken to so arrange the different items as to have them fall short, rather than exceed the estimates now submitted. As it is already obvious to the Board it is scarcely necessary for me to speak, of the propriety of such appropriations as would enable the officers of the line, to urge the work to completion with all practicable despatch. I may, how-

ever, be permitted to express the opinion that the interest of the state would be better promoted by appropriations sufficient to complete the whole line during the years 1840 and 1841, than by the mistaken policy of limited instalments on a fixed sum, which must be worse than unproductive till the whole is invested. Sufficient time has already elapsed since the commencement of the work to have completed it, and the state might now be deriving revenue from the money already expended. I would recommend that the remainder of the work be placed under contract early in the next season, and that an effort be made to have it complete by the spring of 1842. This would require about twelve hundred thousand dollars during the next season, and the balance of the whole estimated cost in the year thereafter. The details of the location and description of the mechanical structures, are in the reports of eighteen hundred and thirty-six and eighteen hundred and thirty-eight made by my predecessor, and it has not been thought necessary to recapitulate them on the present occasion.

I am, very respectfully, your obedient servant,

WILLIAM B. FOSTER, Jr.

Principal Engineer North Branch Extension Pennsylvania Canal.

Towanda, November 1839.

[No. 26.]

Report of W. Milnor Roberts, Principal Engineer, French Creek Division.

To the President and Board of Canal Commissioners of Pennsylvania.

Gentlemen: I have the honor to present the following Report upon the past operations and present condition of the French Creek Division:

This line was placed under my charge, by a resolution of the Board, dated March 5th, 1839. It embraces the French Creek Feeder, twenty-one miles in length, extending from Bemus' dam, two miles above Meadville, to the out-let at Conneaut lake; and the Franklin line, twenty-five and one half miles in length, extending from the

feeder aqueduct, seven miles below Meadville, to the Allegheny river, at the town of Franklin.

Comprehensive and detailed estimates of the cost of putting this division in thorough repair, were submitted by Dr. C. T. Whippo, Engineer, in the fall of 1838, and a special report and estimate of like character, were furnished in February last, by William E. Morris, Esq., Engineer.

Dr. Whippo's estimate of the cost of repairing this division, was $162,455, exclusive of the cost of constructing 3¾ miles of new canal, which he estimated at $58,711.

Mr. Morris' estimate of the total cost of repairing the division, amounted to $236,500.

A portion of this division was completed in 1829, the remainder in 1834. From the want of sufficient appropriations for repairs, and its consequent inadequate protection from the destructive effects of floods, it may with truth be averred, that the improvement has not, at any time, been useful for navigation throughout its whole extent. The French creek feeder is intended to convey the waters of that stream to the Conneaut lake, which, when raised to the proposed height of 11 feet above its present surface, will form the summit level and great reservoir of the Erie Extension, or main line of canal. It is twenty-eight feet wide on the bottom, with a descent of three inches to the mile, and the banks have a slope of 1½ feet base to one foot rise, calculated for four foot depth of water.

The location of this line, when we take into consideration the purpose for which it was principally planned, viz: the main feeder of an extended canal, was not made with that degree of care which its important functions would seem to demand. Its course is exceedingly serpentine, and the curvatures are, in numerous instances, extremely abrupt. Many of them may be much improved, and the line materially straightened, but a radical correction of the defects now existing, must necessarily be attended with considerable expense.

The feeder dam at Bemus' mill, was greatly injured by the freshet of July, 1837, the water having risen to a great height, and forced a passage entirely around the eastern abutment—forming a new channel, about one hundred and fifty feet wide, through which the stream now flows. The wier of the dam was two hundred and ten feet in length: had it been three hundred feet, or more, originally, it would, in all probability, have escaped serious damage. Owing to the confinement of the stream at this point, the water rose in the pool and swept away about three hundred yards in length of the protection mound or embankment, on its eastern side. Should the site of the dam remain unchanged, it will be necessary to construct a new piece of dam, one hundred and fifty feet long, and one new abutment. The abutments on the western side may be repaired, and protection cribbs, filled with stone, should be built as additional secureties. A portion

of the original dam was in part taken down, after the flood of 1837, in order to afford a free vent for future freshets, but this can be replaced at a small expense.

The following is the estimated cost of re-building and extending the dam and all its appurtenances, making it a complete and safe work:

Repairing old dam and abutment,	$1,400 00
Building 150 feet of new dam, at $20 00,	3,000 00
450 perches of new abutment, at 4 00,	1,800 00
Protection cribs,	1,750 00
Excavation under water, 500 yds. at $1 00,	500 00
" above " 800 " " 15,	120 00
Embankment, 18,000 c. yds. at 20 cts.,	3,600 00
Slope wall, 1,300 perches, at $2 00,	2,600 00
Head gates, &c.,	150 00
	$14,920 00
Contingencies, 10 per cent.,	1,492 00
	$16,412 00

The next important item of repairs on the feeder, occurs at the aqueduct across French creek.

Independently of the decayed condition of this structure, requiring a total renewal of the wooden trunk, and heavy repairs to the stone abutments and one of the piers, it is defective in its place. The trunk being but fifteen feet in width, the water in the prism of the canal flows through an area of one hundred and thirty-six square feet, whilst at this point it is contracted to sixty square feet—which of course would limit the discharge into the Conneaut reservoir, to less than one half of the general capacity of the feeder.

By a resolution of the Board, passed March 25th, 1839, all uncovered aqueducts are to be constructed or re-built at least thirty-five feet wide in the clear. Should this be widened to that extent, it would afford an area of one hundred and forty square feet, which would be rather more than in the prism of the canal, and thus no diminution in the flow would be occasioned.

The aqueduct now rests upon two abutments and three piers, having four spans of sixty feet each. I propose to substitute, in lieu of the present structure, an aqueduct of two spans of one hundred and twenty-five feet each, built upon the arch and truss plan. It would only be necessary to take down and extend one end of each abutment, and one end of the centre pier. The stone in the other two piers, with a small portion of new stone, will answer to build three of the required additional width.

The estimated cost is as follows, viz:

Taking down and re-building 1,700 perches of stone, at $3 50,	$5,950 00

Taking down the old trunk, and building a new one of extra width, 280 feet long, at			$35 00,	9,800 00
Riprapping pier,	200 c. yds.	at	$1 00,	200 00
Excavation,	2,500 " "	"	15,	375 00
Embankment,	3,000 " "	"	20,	600 00
Puddling,	1,000 " "	"	40,	400 00
Foundations, sheet piling, &c.,				500 00
				$17,825 00
Contingencies, 10 per cent.				1,782 50
				$19,607 50

AQUEDUCT OVER WATSON'S RUN.

This is a small structure, the trunk being but forty feet in length. It should be widened, and a new superstructure put on.

The estimated cost of putting it in thorough repair, is as follows, viz:

300	perches of wall, at		$4 00,	$1,200 00
40	feet lineal of superstructure, at		$22 00,	880 00
500	c. yds. of excavation,	"	15,	75 00
1,500	" " " embankment,	"	20,	300 00
500	" " " puddling,	"	30,	150 00
Foundation, sheet piling, &c.,				250 00
				$2,855 00
Contingencies, 10 per cent.,				285 50
				$3,140 50

The waste weirs on this line, seven in number, are all more or less decayed. They should be entirely re-moddled, and built on a more permanent plan. The estimated cost of removing the old wiers, and re-building them on a permanent plan, is $1,200 each, or for seven wiers, $8,400.

The bridges, except a few in the vicinity of Meadville, and one at the crossing of the Mercer turnpike, are in a very dilapidated condition. Most of them have wooden abutments, requiring a total renewal. Some of them are located at points where no necessity for their erection seems to exist, and others have been so little used, that I have no doubt that the right of dispensing with them can be purchased for trifling sums. The cost of re-building the remainder do. (assumed as twenty-five in number,) with stone abutments, is estimated at $750 00 each, or, in all, $18,750 00.

The estimated cost of clearing out and straightening the first nine miles from Bemus' dam to the aqueduct, is $500 per mile, or $4,500; and on the remaining twelve miles, the estimated cost of clearing out, straightening, guarding against quick sand, &c., is $1,500 per mile,

or $19,000. To this should be added the cost of raising the towing path, from the aqueduct to Conneaut lake, an average height of eighteen inches—rendered necessary in consequence of the contemplated increased elevation of three feet in the Conneaut reservoir.

Estimated number of Cubic yds. 45,000, at 15 cents,	$6,750 00

A new outlet lock will also be required at the mouth of the feeder, and a set of guard gates. Should they be charged to the feeder line, the additional expense would be, $11,000 00

RECAPITULATION OF THE COST OF REPAIRING THE FEEDER LINE.

Feeder dam at Bemus mill,	$16,412 00
Aqueduct over French Creek,	19,607 50
Aqueduct over Watson's Run,	3,140 00
Waste weirs,	8,400 00
Bridges,	18,750 00
Canal,	22,500 00
Raising towing path,	6,750 00
	$95,560 00
Outlet lock and guard gates,	11,000 00
	$106,560 00

Should the Board conclude to remove the site of the Feeder dam about two miles higher up, at a point below M'Griffin's falls, the estimated additional cost to the state would be as follows, viz.

New dam, 360 feet wier, at $17 00,	$6,125 00
New guard lock, (using the stone from the old lock)	7,500 00
New canal,	13,000 00
Protection crib,	1,300 00
New damages to land owners on canal,	1,000 00
Bridges,	2,350 00
Waste wier,	1,200 00
Fencing,	600 00
	$33,075 00
Deducting from this sum the estimated cost of repairing the old dam,	16,412 00
Leaves a difference of,	$16,663 00

But to this must be added the amount of damages that may be awarded (in case the site is changed) to Dr. Bemus, whose water power arrangements were destroyed by the state works; and the amount that may be awarded to the owner of the water power and mill property at M'Griffins falls. Sums which I am not prepared to designate.

At the adjourned session of the legislature a bill was passed appropriating fifteen thousand dollars for the purpose of repairing bridges,

and rebuilding the Feeder dam, at a point to be determined by the Board. This amount should be deducted from the estimated cost of repairing the French Creek feeder, which leaves the total appropriation required ninety-one thousand five hundred and sixty dollars, or, if the site of the feeder dam should be changed to the location below M'Griffin's falls, exclusive of damages for Water power, &c. $108,223 00

I have no hesitation in expressing the opinion that the upper location would have been preferable in the first instance; but the question now assumes a new aspect, and as I am satisfied that the work can be rendered entirely secure at the present site, it appears to me to be, independently of all private feeling or interest, a mere question of cost, the decision of which is greatly in favor of rebuilding the present damaged works.

Mr. Brawley, the supervisor on the feeder line informs me that he expended in repairs, from April to October inclusive, $2,350 14. The work done was confined to the removal of hill slips, and deposites of sand and gravel accumulated at the outlet of small streams emptying into the canal.

With an appropriation of fifty thousand dollars to be expended in 1840, and the balance in 1841, the feeder line can be put in complete order to meet the completion of the main line of canal.

FRANKLIN LINE.

The Franklin line commences at the aqueduct over French Creek, and extends down that stream 25½ miles, to its junction with the Allegheny river, at Franklin.

The lockage is 128½ feet.

On the present proposed arrangement of the summit level at Conneaut Lake, the surface of the canal, at the aqueduct, will be level with the great reservoir, when full; and 510 feet above the level of Lake Erie.

The descent in the Allegheny river from Franklin to Pittsburg, is 261 feet. So that the river at the latter place is 120.50 feet above Lake Erie.

The principal works now on the Franklin line, are, nineteen cut stone locks, (eighteen feet wide and ninety feet long in the chamber); five dams, thirteen towing path bridges, and three canal bridges.

In the original construction of this line there were about four and-a-half miles of canal, and twenty-one miles of slack-water navigation. In 1835 Dam No. 4 was carried away by floods and the site afterwards abandoned; a piece of new canal, about one and-a-quarter miles long, has since been partly constructed, and the old guard lock has been removed and rebuilt as an outlet for the new canal. During the last session of the legislature a law was passed requiring the removal of Dam No. 1, at Sugar Creek. In pursuance with instructions received from the Board to that effect, the supervisor removed the dam this summer, and with it, all just cause of complaint from the land owners above; through whose instance this measure was brought

about. It was one of the best and safest dams on the line, and very low; raising the creek less than four feet above its original level. When the line was first located, it might have been better to have dispensed with this dam, and to have substituted an independent canal of nearly four miles in length. But after the dam, guard lock, and towing path were made, and in comparatively good repair, the question assumed a different bearing. The true policy would have been to have left the works as they were, estimating and paying a fair equivalent for damages caused by flooding the lands above.

To make the navigation complete, it will now be necessary to construct a new piece of canal nearly four miles long, to remove and rebuild one lock, to build an aqueduct across Sugar Creek, three culverts, two waste wiers, seven farm bridges, three road bridges, and twelve hundred perches of fence. If it is not too late, I would yet respectfully recommend that the amount of damages which would be caused by the rebuilding of the dam to within eighteen inches of its former height, be ascertained, and that authority be obtained to rebuild the same, should the Board upon further examination deem it expedient.

In regard to the Franklin line, generally, common rumour, which is so frequently at fault, has truly pictured its situation. It has been for several years a source of vexation and expense to all who have had occasion to use the uncertain and precarious navigation it affords. Whilst the amount of Tolls received have borne but a small proportion of the annual expenditure for repairs, inadequate as that has been.

The chain of ascending navigation may be considered as completely broken by the destruction of Bemus dam and dam No. 4, and the danger to descending craft are very considerably increased by the peculiarly awkward position of the stream at those points. It is undoubtedly, in its present state, a positive evil, and a great drawback to the prosperity of the fine country watered by the French Creek and its tributaries.

Whatever policy may have dictated the very early and premature construction of this work, common justice would now seem to demand some decisive action in regard to it. Not the appropriation of five or ten thousand dollars annually, which can merely serve to procrastinate its final destruction, but a liberal and sufficient sum to render the navigation complete and of some public utility.

I will here quote the words made use of in the concluding report of Dr. Whippo, the engineer lately in charge of this line.

"It therefore appears to me to be the true policy to make these "repairs as soon as practicable. Steamboats are now beginning to "ply to considerable extent upon the Allegheny river, between Pitts- "burg and Franklin, and as soon as this improvement is made navi- "gable, a large amount of business will pass through it from the "French Creek valley. Thus considerable Tolls will be collected, "the work will be preserved, the business community will be accom- "modated, property will be enhanced in value, and the long anti-

"pated result of the improvement will in some measure at least be "realized."

There is yet another consideration. Should reasonable appropriations be made to the Erie Extension of the Pennsylvania canal, that important work will be completed within two years from this time. There will then be a continuous canal from lake Erie to Franklin. It is fair to presume that a considerable trade will immediately follow; salt, plaster, and other staples, will then be brought in this direction from the state of New York, and in return, the iron, lumber, &c. of the French Creek valley will find a ready market in the boundless region of the Lakes.

Conventions of the highest respectability have recently been held at Franklin and Pittsburg, by the citizens of the Northwestern counties of Pennsylvania interested in the improvement of the Allegheny river, and from the spirit manifested in their proceedings, and the well known energy and enterprise of the inhabitants of this section of the state, it is reasonable to anticipate that their exertions will at an early day be crowned with success; and thus bring to light the hidden treasures of our Northwestern counties.

Entertaining these views, I would most respectfully urge that an adequate appropriation be asked for to put the French Creek Division in thorough repair.

Estimated cost of repairing and completing the Franklin line.

Constructing $3\frac{7}{8}$ miles of Canal, from Lock No. 3, to the Sugar Creek dam, rendered necessary by the removal of that work.

Canal,	$29,063 00
Lock (of cut stone)	9,000 00
Aqueduct over Sugar Creek,	6,400 00
Three culverts,	1,850 00
Two waste wiers,	1,600 00
Seven frame bridges and three road bridges,	6,000 00
Twelve hundred perches of fence,	600 00
Total, exclusive of damages,	$54,513 00

Completing $1\frac{1}{4}$ miles of Canal, rendered necessary by the abandonment of Dam No. 4.,

Canal and appendages, (not including lock, which is completed and returned final,)	$17,500 00
Deduct amount of work done,	5,268 64
	$12,231 36
Add for 300 Perches of fence at fifty cents,	150 00
Total, exclusive of damages,	$12,381 36

REPAIRS.

Lock No. 4. The walls of this lock are collapsing, having already contracted the width of the chamber more than one foot. It must be taken down and rebuilt. Estimated cost,	$7,000 00
Locks Nos. 8, 10 and 15. Will shortly require extensive repairs, a considerable portion of the walls must be taken down and rebuilt. Estimated cost,	18,500 00
Repairs at other locks,	2,000 00
Dam No. 2. Requires a crib below, (a protective crib was built during the past summer.) Estimated cost,	2,900 00
Dam No. 3. Estimated cost of completing crib and other repairs,	3,800 00
Dam No. 5. Estimated cost of completing crib and other repairs,	4,250 00
Dam No. 6. This Dam has been extended about 120 feet beyond the original plan. It is finished to the height of low water mark, and a new abutment and guard embankment have been built. It will require to complete and secure it with a crib below,	6,480 00
Dam No. 7. A protection embankment was made and a crib finished during the past summer. It will yet require to put the dam in good repair,	1,200 00
Dam No. 8. Requires some gravelling and a few other repairs. Estimated cost,	1,000 00
Dam No. 9, requiring a crib below, a protection crib, some new sheeting, &c., estimated cost.	3,400 00
Dam No. 10, a protection crib was built at this dam during the past summer, it yet requires a crib below about 290 feet in length, and other repairs, estimated cost of completing,	4,150 00
Dam No. 11, requires but few repairs, estimated cost,	150 00
Towing path bridges, estimated cost of repairs,	3,600 00
Canal Bridges and wiers,	450 00
The towing paths are in many places too low and considerably abraded by the action of the stream. To raise and secure them properly, it will require an expenditure of	6,000 00

RECAPITULATION.

Of the estimated cost of putting the Franklin Line in complete repair.

New canal below lock No. 3.	$54,513 00
Completing 1¼ miles of canal above dam No. 4.	12,381 36
Repairing lock No. 4,	7,000 00
do do 8, 10, and 15,	18,500 00
do other locks,	2,000 00
do dam No. 2,	2,900 00
do do 3,	3,800 00
do do 5,	4,250 00
do do 6,	6,480 00
do do 7,	1,200 00
do do 8,	1,000 00
do do 9,	3,400 00
do do 10,	4,150 00
do do 11,	150 00
do towing path bridges,	3,600 00
do canal bridges and wiers,	450 00
do and raising towing path,	6,000 00
Total estimated cost.	$131,774 36

It will be observed, that of this sum, $54,513 00 arises from the necessity of constructing a new piece of canal, in consequence of the removal of the dam at Sugar creek. I have not positive data, but my impression is, that if the damages to land owners, were fairly assessed, there might be a saving of $25,000 to the state by restoring the dam, with the proposed diminution in height.

The locks on this line, were built originally of cut stone, laid in common lime mortar. There is, therefore great reason to apprehend, that when they come into active use, more of them will fail.

Nothing, however, has been included in the foregoing estimates to cover this anticipated item.

The small sums placed in the hands of Mr. Brawley, supervisor of the French creek feeder, and Mr. Adams, supervisor of the Franklin line, have been judiciously expended: but it is evidently impossible, to effect the radical improvement required, with appropriations so limited.

I learn from Mr. Elliott, the collector at Franklin, that the tolls this year, have amounted to only a trifle more than $800 00.

The amount expended in repairing the Franklin line, by Mr. Adams, supervisor, from April to October inclusive, is $6,415 41

Before concluding this report, I think it proper to correct an erroneous impression in regard to the supply of water from French Creek, which is conveyed in the report of a committee of the Senate, of which Mr. Strohm was chairman, read May 24th, 1839. The language of the report is as follows:

"The construction of this line seems to have been very unwise, and a further expenditure of money in repairing it, would also seem to be injudicious."

"If the waters of the French Creek should be found necessary to supply the Shenango and Conneaut lines, the capacity of the feeder will be adequate to convey nearly all the waters of that stream, except during the periods of freshets or wet seasons, into the Conneaut Lake, as the reservoir for supplying the above canals. Having thus diverted the stream from its natural channel would it not be folly to maintain dams and locks, collectors, supervisors, and lock-keepers, upon a stream that for three-fourths of the boating season will be destitute of an adequate supply of water."

"Your committee believe it would be advantageous to the inhabitants along the French Creek Valley, to have the dams removed, leaving to them the unobstructed natural descending navigation of the stream. Yet the committee are unwilling recommend such an apparently destructive measure, until the completion of the Erie Extension be consummated, when actual demonstration will prove the correctness or fallacy of these anticipations."

I have quoted all the remarks on the subject to prevent the least misapprehension of the views of the committee.

A reference to the calculations of the supply of water from the French Creek feeder, which will be found in my report on the Erie Extension, will I think satisfy any reasonable mind that there is abundance of water for a large amount of trade on both lines, throughout the boating season. The leakage also of twenty-one miles of the Feeder line will all pass into the pools of the Franklin line; and the Conawango Creek and Sugar Creek, which empty into the navigation near the upper end of the Franklin line, form no part of the estimated supply of the Conneaut Lake, so that the Franklin will be well supplied.

In regard to the alternative suggested by the committee, "to have the dam removed," it will perhaps be better to wait until "actual demonstration has proved the correctness or fallacy of their anticipations," but, in the meantime, the interests of the inhabitants and of the commonwealth must suffer seriously should the work of repairing the line, be longer delayed.

Respectfully submitted,

W. MILNOR ROBERTS, *Principal Engineer.*

ENGINEER'S OFFICE, ERIE, Nov. 22d, 1839.

[No. 28.]

Report of W. Milnor Roberts, Engineer,

ERIE EXTENSION.

To the President and board of Canal Commissioners of Pennsylvania.

GENTLEMEN:—

In conformity with instructions, received from Thomas S. Wilson, Esqr., secretary of the board, dated October 30, 1839, I have the honor to present the following annual report.

The Erie extension was placed under my charge by a resolution of the board, dated, March 2, 1839.

The whole length of the Erie Extension, commencing at the head of the pool, six miles above New Castle, and terminating in the harbor of Presque Isle, at Erie, is 105½ miles; divided into two lines, viz: the Shenango Line, extending to the summit at Conneaut Lake, sixty miles, and the Conneaut Line, reaching from thence to Erie, forty-five and a half miles. The total ascent from New Castle pool to the summit, where the reservoir is full, is two hundred eighty-seven and a half feet, and the total descent from the summit to the surface of Lake Erie, is five hundred and ten feet, total lockage seven hundred ninety seven and a half feet.*

The Shenango Line was located in 1836, and the Conneaut Line, in 1838, by Dr. C. T. Whippo, who had charge of the work as principal engineer, until the period of my appointment, in March last.

Taking the whole work together, it affords me pleasure to assure the board, that great care and skill have been displayed, in the location of this important portion of our public improvements. The canal with some few minor exceptions, has been laid out with good judgment. The locks, dams, aqueducts, waste wiers and bridges, have been well planned, and so far as the work has progressed, it appears to have been executed in the most faithful and substantial manner.

In regard to the character of the mechanical works, but two instances occur, wherein, according to my judgment, any material error was committed, in the original plan, viz: at Elk and Walnut creek,

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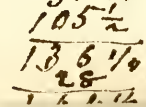
* The total length of the Erie Extension, has hitherto been considered 109½ miles, but this includes 4 miles of canal, along the south side of the Conneaut Reservoir, upon which boats trading only on the main line will not pass. I have considered, these four miles, as more properly belonging to the *Feeder Line, continued.*

It has been ascertained, that the surface of Lake Erie, is nine tenths of a foot lower, than it was one year since; about two feet lower, than it was a few years ago, and about one foot above its lowest stage. The out let lock at Erie, is averaged for 5½ feet depth of water at its present height.



on the Conneaut Line, which it was designed to cross by means of high embankments and culverts.

Soon after my first examination of the line, last spring, a special communication was made to the board on this subject, which resulted in the abandonment of the culverts and embankment, and the adoption of aqueducts, at an estimated saving of upwards of $100,000.

The ordinary size of the canal, is 28 feet wide at bottom, back and slopes 1½ to 1, calculated for 4 feet depth of water. In many cases, however, the canal has been excavated to a greater width. Wherever it could be done conveniently, I had the inner slopes changed from 1½ to 2 to 1, and all the work not previously commenced, has been laid out with the latter slope.

GENERAL DESCRIPTION OF THE LINE.

Commencing at the head of the Beaver division, at the upper end of the New Castle pool, the Line is located through the Shenango valley, along the Eastern side of the stream; which, owing to its remarkably serpentine course is occasionally cut off at the bends and new channels made for its bed. In numerous instances, the canal is constructed partly on the river, and protected from the floods, with permanent slope wall.

The level is laid low; most of the small streams being taken into the canal, which passes along the margin of the bottom land, and frequently through swampy ground. In this way a vast number of small reservoirs, or wide reaches of canal, are formed; giving a peculiar and distinctive character to the line. The advantages to be derived from this location, are, a saving in the loss of water from soakage and leakage, and the increased facility it will afford to the passage of boats.

A sufficient number of permanent waste weirs are located at proper points to carry off the surplus water which may fall in heavy rains.

At Sharps's mill (about twenty-one miles,) the first dam is built. It is two hundred and twenty-nine feet long, and twelve and a half feet high. The pool erected by this dam is five miles long, affording three miles of slack water navigation, and passing over, at a moderate expense, a portion of the stream along which it would have been difficult and expensive to construct a canal. The hill being high and steep along the margin of the pool.

Dam No. 2, is situated below the Big bend of the Shenango, making slack water navigation for two and a half miles, to Lock No. 15.

Dam No. 3, is built at Greenville, a little below the junction of the Big and Little Shenango creeks, the waters of which, it takes into the canal. This is a low dam, flowing the water back but a short distance. The Little Shenango is crossed at this point by a towing-path bridge, extending from the head of Lock No. 21, (Guard) to the tail of Lock No. No. 22, (out-let.)

Here the line leaves the main stream, and follows the course of the Little Shenango for four miles, to the mouth of Crooked creek.

Dam No. 4, is at Sontzenheiser's mill, two miles above Green-

ville—the slackwater extending one and one-sixth miles, to William-son's mill; at which point Dam No. 5, is located.

This dam backs the water to Lock No. 26, four miles above Greenville, where the valley of Crooked creek commences. From this point to Hartstown, at the out-let of the Pymatuming swamp, about seven miles, the canal is located on the western side of the stream, over an uncommonly favorable ground and through a fertile beautiful country.

The Pymatuming swamp presents one of the most difficult and interesting points on the route.

The line crosses it near its south-eastern extremity, the out-let of which is to be secured by a heavy embankment, one thousand feet long and fifteen feet high. This is a very extensive swamp, reaching in a north-westerly direction about twenty miles and terminating in the state of Ohio. The canal line is located for about three miles across it, cutting off all to the north-west.

The loose black loam and decayed vegetable matter, of which it is composed, have an irregular depth, varying from ten to forty feet. As the embankments progress the lighter material is forced up on either side. It is interspersed occasionally with spots of fine earth, which are designated as Islands. These Islands afford the only material in the vicinity, of sufficient weight to make a water-tight embankment.

The embankment is to be raised to a sufficient height to create a reservoir eleven feet deep, which will flow over nearly six hundred acres. This is a secondary but very important reservoir, on a level about fifty feet below the main reservoir at Conneaut Lake. It will contain, (over and above the usual canal depth of four feet,) upwards of one hundred and forty-five millions of cubic feet of water.

A very small portion of good land will be covered by this reservoir; and all the timber and brush will be entirely removed before it is filled—leaving a beautiful sheet of water, bounded by the hills on one side and the artificial banks of the canal on the other.

From the Pymatuming swamp, the line passes over favorable ground for four miles to the Beaver dam summit, where there is a deep cut of three thousand five hundred feet in length, varying in depth from ten to thirty feet. The material to be excavated consists of muck, or decayed vegetable matter, clay, gravel, marl, and quicksand. So far as the excavation has progressed at this point no serious difficulty has been encountered, nor is any anticipated, as experience has shown that the quicksand is easily removed, when it can be thoroughly drained, as it is in this instance.

From this deep cut, the line passes into the basin of the Conneaut Lake, and runs along its north-western margin, meeting the Feeder line, continued on Section No. 78.

This is the junction of the Shenango, Conneaut and Feeder lines; a point sixty miles from the commencement of the Erie extension, forty-five and a half miles from Erie harbor, and forty-one miles, by the canal, from Franklin.

Conneaut Lake, at its present elevation, is four feet below the bottom line of the canal, the level of which was kept up in order to reduce the deep cutting at the Beaver dam summit, and on the first five sections of the Conneaut line. It is intended to convert this lake into a vast reservoir, by embanking across the outlet at Evansburg. The embankment, which also forms the towing path, is to be continued around the south-western margin of the basin to the junction referred to, above. The water, when raised, will be eleven feet above its present surface; covering two thousand six hundred acres. The upper three feet of the reservoir will be available as a supply during the driest part of the year; containing three hundred millions of cubic feet of water, over and above the usual depth of the canal.

The position of this lake is peculiarly favorable for the purposes to which it is to be applied, constituting as it does, not only an immense supply reservoir, but, forming at the same time, a beautiful navigation, comprising four miles of the main canal and four miles to be added to the Feeder line. It will be one of the most extensive artificial basins in this country. Here the Shenango line terminates.

The Conneaut line, commencing at this point of junction previously mentioned, passes through the lowest part of the dividing ground, between the waters of the Ohio and Lake Erie, called the Conneaut summit, by a deep cut two and a half miles long; from ten to twenty-seven feet deep. The canal is on the same level, and the excavation is generally similar to that met with on the Beaver dam summit, near the end of the Shenango line; except that the quicksand has occasioned, and seems likely still to cause greater difficulty and expense. It cannot be so easily drained, and is more thoroughly saturated with water. It has been found expedient to drive piles in several places, to the depth of twenty feet, to prevent the sides of the canal from slipping in. At one point this has been attended with complete success.

The contractors on the summit sections are enterprising and energetic, and I do not in the least doubt, that their work will be finished in time to meet the completion of the new work on the Conneaut line.

After leaving the summit, the line runs in a northerly direction down the valley of Conneaut creek, twenty miles; passing through Powerstown and Jacksonville, and near to Cranesville and Spring corners. It then takes a north-easterly course to the head of Hall's line, crossing Elk creek by an aqueduct four hundred feet long, and eighty-four feet high (within a mile of the village of Girard, through which the canal passes.) It then continues on the high bench of land between the Ridge Road and Lake Erie, running nearly parallel with the shore, till it enters the borough of Erie. The line there turns toward the north, running obliquely through the town, by a succession of locks, separated only by short pools, and terminates at the Harbor, at Navy yard run, below Read's Pier.

The canal crosses Walnut creek, nine miles from Erie, and only one and a fourth miles from the mouth of the creek, by a gigantic

aqueduct six hundred feet in length; elevated one hundred feet above the stream.

The whole length of the Conneaut line is forty-five and a half miles. Total lockage five hundred and ten feet.

The character of the Conneaut Line is very different from that of the Shenango Line. Necessarily so, from the different nature of the country through which it is located.

The valley of the Shenango, abounds with sandstone of the finest quality for building purposes, the hills are full of excellent bituminous coal, and limestone exists in considerable abundance, probably to a greater extent than is generally supposed. But soon after we pass the Conneaut summit, and descend towards the Lake, the sandstone, coal, and limestone; which, from their geological position range too high, are lost. No good quaries, and, with two exceptions, no rock excavations of any kind occur on the line between the summit and the Lake.

Argillaceous slate rock, of an inferior quality, is found at a few points near the Line, but no stone fit for cutting has yet been discovered.*

The streams north of the summit, are violent, and subject to sudden and great fluctuations, resembling in this respect, mountain torrents and, in some instances, as at Elk and Walnut Creeks, their beds or valleys have been torn into terrific gulfs.

Notwithstanding these unfavorable features, the general route of the Line is upon favorable ground; where moderate excavations through loam and clay, serve to form the prism of the canal. But the great misfortune is, that the largest amount of Lockage occurs in a region destitute of good stone, and we are consequently unable, without encountering an enormous expense, to carry out the cut stone plan adopted on the Shenango Line.

With the exception of the two last Locks, at Erie harbor, it has therefore been proposed to build the Locks upon the composite plan, consisting of high walls of stone laid dry, and lined with water tight planking.

A plan was made, and proposals received, for building some of the Locks entirely of wood, arranged in such a manner that the walls could afterwards be introduced behind the planking. But the Board having sanctioned their construction upon the composite plan, no calculations for wooden Locks have been included in this report.

The stone for the two Locks No. 70 and 71, at Erie, will be obtained near Sandusky, and transported by water thence to Erie. It

* An extensive quarry has been opened on Elk Creek, about six miles by the road, from the Elk Creek aqueduct, from which stone may be otained for the abutments and piers of that structure, and for the composite locks in the valley of Hall's run. There is also a quarry at the mouth of Walnut Creek, one and-a-quarter miles from the Walnut Creek aqueduct, which presents several strata from six to nine inches in thickness, of sufficiently good quality to form the interior work of the piers and abutments; generally, the stone for the composite locks must be transported from four to seven miles,

is a hard, yellowish limestone; and, when dressed, presents a very good appearance, and will make substantial masonry.*

GENERAL DETAILS OF THE SHENANGO LINE.

The Shenango line is divided into sections of about one mile in length as far as section No. 47, above Greenville; from thence to the junction, at Conneaut Reservoir on section No. 78, the sections are each about half a mile in length. Sections No. 79 to 84, inclusive, extend from the junction along the southern margin of the great Reservoir to the outlet of the French Creek feeder, at Evansburg.

On the Shenango Line there are forty-four locks, overcoming an elevation of 287½ feet. Of these, Locks Nos. 1 to 35, inclusive, are of cut stone; and Locks No. 36 to 44, inclusive, are upon the composite plan, with stone walls and wooden facing.

There are five dams, three aqueducts, twenty-one road bridges, forty six farm bridges, eleven towing path bridges, twenty-four waste wiers and thirty-eight lock houses.

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* The following are the points of most interest on or very near the Line. at the distances (from the commencement of the Erie Extension at the head of slack-water, six miles above New Castle,) respectively annexed, viz:

Town of PULASKI, east side of Shenango,	6 Miles.
Town of SHARON, west side of Shenango, within one-fourth of a mile of the Ohio Line—fine coal region,	17 do
Town of CLARKESVILLE, east side of Shenango,	26 do
BIG BEND of Shenango. Town laid out,	31 do
GREENVILLE, on both sides of the Shenango. This is the most flourishing and important of the intermediate villages, on the route of the main Line,	42 do
HARTSTOWN, at the outlet of Pymatuming Swamp,	53 do
SHERMANSVILLE, recently laid out,	58 do
JUNCTION, of Shenango, Conneaut and Feeder Lines. This point is four miles from Evansburg or Conneaut Town, by the reservoir navigation, and twenty-three miles from Meadville, by the Feeder Line. From Franklin forty-one miles, and from Erie 45½ miles,	60 do
DEEP CUT BRIDGE, Conneaut summit,	62 do
CONNEAUTVILLE, or Powerstown, on Conneaut Creek,	68 do
MARION VILLAGE. Line passes near,	73 do
COLES RUN. Culvert,	76½ do
JACKSONVILLE, at Jackson's Run,	80 do
EAST BRANCH of Conneaut, Culvert, two spans of 30 feet each,	81 do
CRANESVILLE. Line passes near,	81½ do
LOCKPORT. Recently laid out—flight of Locks.	85 do
ELK CREEK, aqueduct—84 feet high—400 feet long—2 span,	87½ do
GIRARD, village—Deep Cut,	89½ do
WALNUT CREEK, aqueduct—100 feet high—600 feet long—3 span,	96 do
CASCADE RUN,	103½ do
HARBOR OF ERIE, (population of Erie, about 6,000)	105½ do

The following is a list of the work finished on this line, viz:

Sections Nos. 1 to 47 inclusive, and sections Nos. 53, 59.
Locks Nos. 1, 4, 8, 11, 14, 15, 22, 24, 25.
Dams Nos. 1, 3 and 4. No. 2 is very nearly finished.
Aqueducts Nos. 2 and 3. No. 1 is very nearly finished.
Road Bridges Nos. 1, 2, 7, 8, 9.
Farm Bridges. Five are finished.
Culverts. All the culverts are small—included in the sections.
Waste Wiers Nos. 4, 6, 8, 11, 13, 14, 15, 16, 17.

The work has been carried on with much spirit through the past season, notwithstanding the pecuniary difficulties under which the contractors labored, from the want of an early appropriation, and the uncertainty which existed for some months in regard to funds. In August last, the appearance of the work between the New Castle pool and Greenville, yet gave promise, that with reasonable exertions this portion of the canal might be opened for navigation in the spring of 1840. The material drawbacks to this expectation, seemed to be, the unfortunate situation of Locks Nos. 13 and 20, which had been several times abandoned, and the pits for which were not yet excavated. I expressed the opinion that if these Locks were immediately placed in the hands of energetic contractors, with an understanding that the work must be done forthwith, that the masonry could be completed in two months, and the Locks finished in time for the spring business. Mr. Clarke, president of the Board, being then on the Line, directed that proposals should be immediately received for re-letting these jobs. Proposals were according received until the 23d of August, when Lock No. 13 was awarded to Messrs. Chamberlin & Merriman, and Lock No. 20 to Messrs. Rhodes & Binns. The contracts required the immediate commencement of the work and the completion of the masonry, on or before the 31st of October. The contractors proceeded at once to their duty, and displayed the utmost energy and judgment in the management and prosecution of the work. Within a few days of the time specified, the walls were up and ready for the gates. Thus accomplishing, in about two months, the same amount and kind of labor, which has on this Line, usually occupied two years; and, at the same time, establishing the certainty of a canal navigation to Greenville next spring.

When we take into view the fact, that they had two thousand perches of stone to quarry, cut, and lay; the timber and plank to furnish, and work; and the cement to procure from Lake Erie, by land carriage, over a distance of sixty miles, without any previous preparation; too much credit cannot be awarded to the contractors and all who were concerned.

We may now promise, that all the works on the Line will be completed as far as Greenville, a distance of forty-three miles, and ready for the water about the usual period of opening the navigation in the spring.

The waters of the Big and Little Shenango Creeks, will it is be-

lieved, be sufficient to supply the canal below Greenville for the comparatively limited amount of trade it will command, until the whole Line is completed to Erie.

From Lock No. 26 above Greenville, to the upper end of the Shenango Line, the work was let out long after the lower portion, in the summer of 1838; and but little had been done upon it previous to the present season.

It is now progressing very well; and, should funds be provided for prosecuting it vigorously, this part of the Line, between Greenville and Conneaut Lake, can be finished next year. The heaviest jobs are, sections Nos. 64, 65, and 66, along the Pymatuming Reservoir, and sections Nos. 76 and 77 on the Beaver dam summit. These are in the hands of able and enterprising contractors, from whom we may expect every exertion consistent with the means that may be furnished.

It will be observed that the estimated cost of section No. 66, crossing the Pymatuming swamp, is considerably greater than former estimates. This arises from the fact that in estimating the amount of embankment required, no allowance was made by the late engineer for immense settling which must unavoidably take place in this part of the swamp; actual measurement by sounding with iron rods, has shown that the swamp is from ten to forty feet deep on a part of the section, and we have estimated one hundred and thirty thousand yards, where less than twenty thousand yards have been assumed as sufficient.

GENERAL DETAILS OF THE CONNEAUT.

The Conneaut line commences as before mentioned, at the juncture near the Beaver dam summit, and extends to Erie, a distance of 45¼ miles; divided into 61 sections, and comprising 71 locks, 2 aqueducts, 5 culverts, 50 waste wiers, 41 road bridges and 40 farm bridges.

It was located in 1838, and 11½ miles, including 23 sections and 13 locks; 6 culverts and two bridges were let to contractors.

The jobs put under contract at that time, were sections Nos. 1, 2, 3, 4, 5, summit sections; and sections Nos. 11, 20, 22, 25, 27, 33, 34, 35, 36, 37, 38, 39, 40, 49, 58, 59, 60, and 61. Sections, Nos. 11, 25, 27, 39, 58, 60 and 61, have been completed this season. Section No. 35, at the crossing of Elk creek, and section 49, at the crossing of Walnut creek, were, by order of the board, declared abandoned and returned final, in consequence of changing the plan at those points, from culverts to aqueducts; by which the immense embankments originally constituting the principal items in the contracts, were dispensed with.

The locks put under contract, were Nos. 20, 21, 22, 55, 56, 57, 58, 59, 60, 61, 62 and 64, thirteen in number. Of these, Nos. 21, 22, 61 and 62, are nearly finished, and a considerable amount of work has been done to all the others.

They are all upon the composite plan, of stone and wood combined.

In the original location of the line through the borough of Erie, down the valley of Navy-yard run, it was contemplated in two instances to combine locks together

This arrangement I conceived to be highly objectionable, and the locks are now located separately (altogether at an additional expense of about two thousand dollars) leaving sufficient room for boats to pass in the pool between every two locks.

The disadvantages attending the use of combined locks, unless when made in double flight, are obvious, and they should be avoided whenever it is possible.

The most important jobs on the Conneaut Line (leaving out of view the great reservoir, which is common to both lines) are the summit sections, Nos. 1, 2, 3, 4, and 5; sections Nos. 27, 33, 36, 37, 38, 39, 40, and 45, the cut stone out let lock, in Erie harbor, and the aqueducts over Elk and Walnut creeks.

The acqueduct over Walnut creek is the largest. This stream has now an immense gulf, through which, in times of heavy rains, it rushes with tremendous force. The bottom of the creek, and the sides for about seventy feet in height, are of tolerable compact argillaceous slate, lying in three horizontal strata. The banks on both sides, are precipitate, and rising to the height of one hundred feet. The width across the valley is six hundred feet; requiring an aqueduct nearly of that length, in order to secure a good slate foundation on the banks, with abutments of moderate height.

It is proposed to throw across the gulf, an aqueduct of three spans, each one hundred and eighty-six feet in length, resting on two piers, and two abutments. The masonry to be regularly coursed, and hammer dressed. The piers are to be ten feet thick on top, and built with a batter of one inch for every foot in height. The superstructure is to consist of four ranges of arch and truss work, twenty feet in height, on the top of which, the trunk, seventeen feet wide in the clear, (with a horse path on each side) is to be erected. An intervening course of sloped, water tight planking, will be placed between the supporting frames and the trunk, for the purpose of carrying off the leakage of the trunk. This, with the weather boarding at the sides, will effectually preserve the main superstructure from the effects of wet whether from rain or leakage.

By this mode of arranging the trunk, we shall reduce the height of the piers and abutments, twenty feet, and save at least one fourth of the masonry; and, at the same time, dispense with the cumbersome roof which would be necessary in a structure of like magnitude, built upon the old plan.

The valley at Elk creek, presents features somewhat similar to those of Walnut creek. The aqueduct over Elk creek, will be eighty-four feet high, with two spans, each one hundred and eighty-six feet long, to be built in other respects upon the same general plan as that just described.

Having heard various and conflicting opinions advanced in regard to the means of supplying the Erie extension with water; my attention has been particularly directed to this question, with the view of determining the true state of the case. After a thorough investigation of this important matter, the conclusion arrived at, is, that there will

at all times be an abundance of this indispensable article; as the following data, calculations and results, will, I think, clearly show.

SUPPLY OF WATER, &c.

The principal source for the supply of water for 45½ miles of canal on the Conneaut line, and 15½ miles of canal in the Shenango Line, is French creek.

An artificial feeder twenty-one miles in length, is already constructed. It is twenty-eight feet wide on the bottom, with the sides sloping one and a half feet base to one foot rise, and having a descent of three inches to the mile. The water is taken from French creek, at a point two miles above Meadville, and carried thence down the Eastern side of that stream, for nine miles; where it crosses the creek on an aqueduct about forty feet high. The line there takes a westerly direction, and passes up the valley of the out let of Conneaut Lake on its northern side. The feeder and the stream from the outlet, running in opposite directions, until they meet in Conneaut Lake, at the town of Evansburg or Conneautville.

The intention being to raise Conneaut Lake eleven feet, or three feet higher, was at first proposed when the feeder was constructed; it follows, that the water of the reservoir, where it is filled, will be just level with the surface of the feeder, at the distance of twelve miles. (near the aqueduct.) It will consequently be necessary to raise the towing path on the feeder line, three feet higher at the out let; or on an average, eighteen inches for twelve miles. It will also be necessary to construct a new out let lock, and a set of guard gates, to prevent the possibility of accidentaly drawing off the reservoir, in the event of a breach in the feeder. These have been taken into account and charged to the feeder line.

In the report of Dr. C. T. Whippo, Civil Engineer, dated November 22, 1836, upon the two routes, which were at that time proposed to Erie, termed respectively, the Eastern and Western routes, it is mentioned, that Major Douglass and Mr. Livermoore, had both measured the quantity of water, passing down French creek. The precise point on the stream, when the measurement was taken, is not given, but no doubt it was at a place where all the water could be commanded.

The quantity, according to the measurement of Major Douglass, was 9534 cubic feet per minute:; according to the measurement of Mr. Livermoore, it was 8280 cubic feet per minute. These measurements were made in very dry seasons.

In order to test the question still further, I had the French creek and the flow from the out let of Conneaut Lake, carefully gaged on the 5th and 6th of Sept., last, when the waters were unusually low, although not quite so low as at some former seasons.

The measurement at French creek, at the site of the feeder dam, gave 22800 cubic feet per minute, and at the out let of Conneaut Lake, 325 cubic feet per minute. I have frequently seen French creek in the vicinity of Meadville, during the past summer, and my

opinion is, that it was not at any period of the year, materially, if any lower than at the time it was guaged in September.

But in order to be upon the safe side, in estimating the minimum supply, we will deduct one third or 7,600 cubic feet, leaving 15,200 cubic feet per minute for the minimum flow, at all other times, except the very driest portion of the year, double that amount or more passes down French creek.

We may with safety assume, that the Conneaut reservoir, and the Pymatuming, or Secondary reservoir, will both be filled next spring by means of the feeder from French creek. The question is, whether during the driest part of a dry season, the present arrangements for supplying the Erie extension will be sufficient. The area of the tranverse section of the feeder, is 136 square feet. The descent on the bottom three inches per mile. According to the form of Eytelwein, this would give a mean velocity of 1,1111† feet per second, 66,666† feet per minute, or, 4,000 feet per hour.

The area of the transverse section of the canal being one hundred and thirty-six square feet, the flow will consequently be, $151\frac{11}{100}$ cubic feet per second, or $9066\frac{67}{100}$ cubic feet per minute, or 544,000 cubic feet per hour; and for every 24 hours, 13,056,000 cubic feet. The present capacity of the feeder being insufficient to convey all the water passing down French creek, according to my measurement, at its very lowest stage. The question of enlarging the feeder may perhaps be discussed hereafter.

The Conneaut Reservoir, when raised to the height proposed, viz. eleven feet above its present surface, will cover two thousand six hundred acres; which, it is estimated, will contain 736,164,000 cubic feet of water. Of this quantity, 304,920,000 cubic feet, contained in the upper three feet, can be made available for supplying the canal, in the event of a stoppage from any cause, of the regular flow from the feeder.

The Pymatuming Reservoir on the Shenango line is, on a level, fifty feet lower than the Conneaut Reservoir. The water in this Reservoir is also to be raised eleven feet; the top (seven feet,) of which will be available for canal purposes.

It will cover nearly six hundred acres. It is estimated to contain 215,622,000 cubic feet of water; of which 145,926,000 cubic feet, contained in the upper seven feet, may be used for supplying the canal.

We have then, available from the two Reservoirs, 450,846,000 cubic feet. The minimum flow at the outlet of Conneaut Lake, in Sept. last, was found to be 325 cubic feet per minute, which is to be added to the above. The average flow from the lake throughout the year, is at least three times that quantity; or 975 cubic feet per minute.

Assuming the supply from the French Creek Feeder to be uninterrupted; and the lake itself to furnish an average of 925 cubic feet per minute, the whole average supply would be, per day.

From French Creek Feeder,	13,056,000	cubic feet.
From Conneaut Lake,	1,332,000	" "
Total, per day,	14,388,000	cubic feet.

The demand or consumption required, I have estimated upon the following data, viz. That the evaporation, soakage, and leakage are to be supplied on forty-five and one half miles of the Conneaut Line, fifteen and one-half miles of the Shenango Line, twenty-one miles of Feeder Line, and four miles of the Franklin Line. This will be required on the Franklin Line in consequence of the necessity of constructing a new piece of canal, four miles long, immediately below the French Creek Aqueduct, which must be supplied from the feeder —in all, eighty-six miles of canals.

From the character of the soil, and the general location of the line, 50 cubic feet per mile, per minute, will be a fair estimate of the loss from the causes named. This would amount to 4,300 cubic feet per minute, or, 6,192,000 cubic feet per day.

The two reservoirs will cover a surface of three thousand two hundred acres. The depth of rain falling annually upon this surface, may with safety be estimated at thirty-six inches, and it will be sufficiently liberal to estimate the annual evaporation on the same surface at forty-two inches, making a daily loss of 190,948 cubic feet. There should be added to the annual drainage of about two thousand acres into the Pymatuming Reservoir, not heretofore included, estimated at one-third of the rain falling, or one foot in depth. This would yield daily 238,686 cubic feet.

The account then stands thus :

Daily supply from French Creek and Conneaut Lake,	14,388,000
Daily supply from drainage,	238,686
Total supply,	14,626,686

Daily loss on eighty-six miles of canal, by evaporation, soakage, and leakage,	6,192,000 c. ft.
Daily loss by evaporation, from the surface of reservoirs,	190,948 "
	6,382,948 c. ft.

Leaving 8,243,738 cubic feet to supply the daily consumption by Lockage.

When the Conneaut Reservoir is full, the lift of the Guard Locks will be seven feet. The lock chamber is ninety feet by fifteen feet, requiring an expenditure of 9450 cubic feet every time the lock is emptied. There would be therefore 873 locks full per day.

A boat in passing over the summit, would empty both guard-locks, which would give 436½ boats per day. But in the ordinary course of trade, with the boats moving in opposite directions, it may be assumed that in emptying a lock twice, three boats will be passed; consequently there would be sufficient lockage to pass six hundred and fifty-five boats daily, taking both directions, or a boat every two and one-fifth minutes.

The utmost capacity of the canal could not be set down as more

than equivalent to the passage of a boat every four and two-fifth minutes, leaving half the lockage water during a great part of the season to be used on the Franklin line, or to be otherwise disposed of.

Secondly. To take an extreme case. Let us assume that there may be one hundred days of excessive drought, and that the supply from the French Creek Feeder should by possibility be reduced one-third, or to 8,704,000 cubic feet per day, and that the natural flow of Conneaut Lake should be constantly at its minimum of 325 cubic feet per minute, that no rain should fall during this period, and that the evaporation should be one-half of the whole annual evaporation: the result would be as follows, viz:

Supply from French Creek Feeder and Conneaut Lake 9,148,000 daily.

We must now deduct eleven and one-half inches of canal (to be supplied during this period from the Pymatuming Reservoir) from the whole length before taken—eighty-six miles, leaving seventy-four and one-half miles of canal. The evaporation, soakage and leakage, on this distance, would be, estimating it at 56 cubic feet per mile, per minute, 3725 cubic feet per minute; or, per day 5,364,000

Daily loss by evaporation on 2600 acres of Reservoir, taking it at 21 inches in 100 days, and allowing nothing for rain, 1,887,600

7,251,650 cub. ft.

Which amount, deducted from 9,148,000, the supply from French Creek and Conneaut Lake, leaves a daily supply of 1,896,400 cubic feet, for Lockage.

This, calculated on the same principles before adopted, would pass one hundred and fifty boats per day in both directions. Estimating each boat to carry forty tons, it would give a daily trade of 6,000 tons; or, for two hundred and forty days of boating season, 1,440,000 tons, without drawing down the reservoir one mile.

Lastly.—It has been shown that we will have in the upper three feet of the Conneaut reservoir, an available surplus stock of water, amounting to 304.920,000 cubic feet. Suppose the main line of canal entirely dependent upon this supply, and that the evaporation is going on at the rate of twenty-one inches in one hundred days, and no rain falling.

The length of canal to be supplied will now be reduced to forty-nine and a-half miles, requiring for evaporation, soakage and leakage, as before.

Fifty cubic ft. pr. mile pr. minute; or,	2,475	cubic ft. per minute;
Or, per day,	4,044,000	
Evaporation of Reservoir per day,	1,887,600	
	5,931,600	
From this deduct the natural minimum daily supply of Conneat Lake,	444,000	
Leaves,	5,487,600	cubic feet.
To this add the amount required for the Lockage of 150 boats in both directions,	1,896,400	
Daily consumption,	7,384,000	

This divided into 304,920,000, the number of cubic feet available in the upper three feet of the Reservoir, gives forty-one days.

So that in the event of an entire failure of the French Creek feeder, the heaviest trade which can reasonably be anticipated, could be kept up, from the surplus water of the Conneaut Reservoir for forty-one days; allowing liberally for the loss by evaporation and nothing for rain.

Further—By raising the surface of the reservoir one foot, which, if it should ever be required, can be done at a comparatively trifling expense, the quantity would be increased 113,256,000 cubic feet, affording fifteen days more navigation; or, in all, fifty-six days.

It is scarcely within the bounds of probability that any disaster could happen to the feeder which could not be repaired within that period.

The preceeding facts and calculations being established, I consider the question of the supply of water for the Erie Extension settled.

It will be observed, that in all the foregoing calculations I have used, not the minimum quantity, as ascertained by measurement, to be passing down French Creek during the dry part of the past summer, but a much smaller quantity, viz: that which will naturally flow through a feeder of the present capacity. The feeder can easily be enlarged so as to pass one-fourth more water, by increasing the depth about one foot.

PROSPECTS OF TRADE.

Upon the opening of the Shenango Line to Greenville, next spring, trade, although at first only to a limited extent, will immediately commence. The Shenango Valley, notwithstanding it is far behind some of our eastern counties in point of cultivation, possesses the highest agricultural capabilities. It has been sequestered, as it were, and out of the range of any of the great thorough fares of our country. The tide of emigration sweeping to the west, has passed through the

great channels of Lake Erie, on the north, and the Ohio river, on the south, leaving this interesting section of the state comparatively in the shade.

Capital has come in but slowly; inducements for extensive outlays and close farming have not been presented, inasmuch as the farmers could not with any prospect of success, enter fairly into competition with other regions, blessed with convenient means of access to the great markets. As a natural consequence, thousands of acres of fine land remain to this day uncultivated, and would so have stood many years longer, but for this or some similar improvement. It will now rise in value, enterprising capitalists will soon discover its situation and its worth, and in a few years the Shenango Valley will take a high stand as an agricultural district.

But independently of this consideration, as a source of never ending revenue to the canal, this region enjoys uncommon advantages in point of mineral wealth.

The whole Valley from New Castle to near Conneaut Lake, abounds in bituminous coal of a very superior quality. The coal trade although yet in its infancy in the United States, is destined soon to be the grand regulator of our internal and external commerce.

The rapid advances it has made within the last ten years in the eastern part of Pennsylvania, the discovery of the perfect applicability of coal in the manufacture of iron; its vast utility as a generator of steam; and the infinite uses to which in the way it may be turned, added to the evidence we have of the extent to which it already controls the whole internal economy of Great Britain, must satisfy every inquiring mind of this truth.

The carriage of coal from the Shenango valley to Lake Erie, must form an important item of transportation, as soon as the canal is opened.

The cities and towns bordering on the lakes will immediately adopt its use. The citizens in their parlours, and the manufacturers in their work-shops. And how shall be estimated the enormous consumption which will take place, when it is generally introduced on board of the steamers that ply upon these inland seas? There are already upwards of fifty-six steam vessels on Lake Erie, and the forests are rapidly receding as the number annually increases.

It is believed, upon good authority, that not less than two hundred thousand cords of wood are now consumed in one year, by these vessels: and when the great region surrounding this vast chain of lakes, shall have become densely populated, as it will be in a few years, the present trade, large as it is, will dwindle into comparative insignificance.

Erie alone furnishes from forty to fifty thousand cords of wood, annually, to steam-vessels; and wood is now brought during the winter a distance of ten miles and sold at this place.

The average distance from Erie to the coal region, between Sharon and Greenville, on the Shenango line is seventy miles. When the coal business is regularly established, coal may be delivered on the

canal line for $1,00 per ton, and carried seventy miles for two cents per ton, per mile; or $1,40 cents per ton. Its sale at $3,00 per ton, will therefore yield a handsome profit.

Now, leaving out of view the fact, that wood must gradually rise above its present value as the demand increases, and the facilities for its supply are diminished, by the greater distance of its transportation, it may at once be assumed, that the very moment coal can be delivered on board of the lake steamers for $3,00 per ton, they will adopt it as the principal fuel, because it will be cheaper than wood at its present price of $1,50 per cord.

Within five years after the completion of the Erie extension, the consumption of coal might be safely set down, at a moderate estimate, as follows, viz:

For steam vessels, 400 tons per day, for 210 days,	84,000	tons
For private use, for 10,000 families, in Buffalo, Erie, Dunkirk, &c., and along the western end of the New York canal, at five tons each,	50,000	"
Manufactories at Erie and Buffalo,	20,000	"
Total Tons,	154,000	

Allowing the tolls on the canal to be but eight mills per ton, per mile, the revenue derived by the state on this single item, would be eighty-six thousand two hundred dollars.

It would be no matter of surprise should the tolls from this source, within a very few years, exceed triple that sum.

This is no "idle image of the brain," but a plain, straight forward view of anticipated results: founded on experience of the past, the peculiarly favorable position of the lakes for an extended internal commerce, and the magnificent and almost boundless extent of country to which they are the natural avenues.

Nor will coal constitute the only important item in the trade of the Erie Extension. This canal will form the readiest communication between the Ohio river at Pittsburg, and the Grand Canal of New York. Salt and plaster can be brought from the line of the New York canal in boats to Buffalo; and thence by steamboats to Erie, in six hours. From whence it may be carried in canal boats and distributed along the Erie extension, in return for coal; or carried to Pittsburg, and exchanged for her Iron and other manufactures.

The trade between the upper waters of the Ohio river, and the up country of the Lakes, will be divided between the Erie extension and the cross-cut canal; the latter connecting Cleveland with the Beaver division of the Pennsylvania Canal. An honorable rivalry in this great carrying business must, at all events, have a tendency to give an additional impetus to its growth.

Whether Erie or Cleveland shall be the greater city, is not a question now to be decided. The local advantages of Erie as a port of entry on the Lakes, are familiar to all who navigate them, and when the extensive improvements of the Harbor, now in progress by the

government of the United States, shall be completed, its claims will be universally acknowledged.

The steady, solid growth of the borough of Erie, its rapidly increasing commerce and population, and its peculiarly favorable position, will soon entitle it to the highest rank amongst the "Cities of the Lakes." The completion of the Erie Extension will make it the "Buffalo of Pennsylvania."

COMPARISON OF ROUTES TO THE LAKES.

In the last annual report of Dr. C. T. Whippo, Engineer on the Beaver division, he makes the following remarks touching the Ohio Cross-cut canal and the Erie Extension:

"The Pennsylvania and Ohio canal, which connect with the Beaver division below New Castle, with the Ohio canal at Akron, and through this with the lake at Cleaveland, is an important communication for Pennsylvania. It passes through a rich and populous country, and connecting, as it does, with the lake at a point which is open and free from ice so much earlier in the spring and later in the fall, that at Buffalo, or even at Erie, it will have a decided advantage over both the New York canal and the Erie Extension during these two important seasons of the year—and as the distance to an eastern market is not greater than by any of these routes, and is considerably less than by the other, a very large amount of business may undoubtedly be done through it. But if the Beaver division should remain as it now is [that is, in very bad repair, as it was at that time,] after this communication is open, this business will be lost, and the tolls which would arise from it would also be lost, not only on the Beaver division, but the whole Pennsylvania improvements to Philadelphia.

"The Erie Extension will bring in the trade of the whole Shenango valley, which is now very important and is rapidly increasing."

In perusing these remarks, the inference would naturally be that Cleaveland had some very considerable advantage over Erie, as well as Buffalo. They created that impression on my mind when I was there last winter.

Placing the opinions therein expressed in juxtaposition as they occur in the report, one would suppose that the Ohio route was the only main line through which, as a matter of course, the lake trade was to flow—whilst the Erie Extension should modestly confine itself to the "trade of the Shenango valley."

Although this result may not have been intended, I think it due to Pennsylvanians who have liberally advanced means to assist in prosecuting the Ohio canal to completion, that their own great work, commencing and terminating within their own borders, should not, either intentionally or by omission, suffer from any misapprehension in regard to its real merits and prospects. So far as I can learn the facts in regard to the opening of the ports on the lake, they may be set down as follows, viz: That, upon an average, Erie harbor may be approached from Detroit about three weeks earlier in the spring than Buffalo, and Cleveland about five days earlier than Erie. Some

times, however, the difference between Cleveland and Erie is but a day or two. It is the opinion of those who are competent to judge, that when the United States works are completed, and an entrance effected at the western end of the harbor, that vessels may leave Erie harbor quite as soon as at Cleaveland.

There is an important circumstance connected with this, which goes to show that this difference of five days in the opening of the Harbor at Cleveland, does not confer any material advantage so far as the trade up the lakes is concerned. It is that Erie harbor is always open before the upper lakes are navigable, or free from ice.

The disadvantage which Buffalo generally labors under in the spring, is this: The prevailing winds at that period of the year are from the west, and they carry the floating ice of the lakes down.—Buffalo, being near the out-let, is necessarily subject to the inconvenience resulting from an accumulation of immense fields of ice, which do not disappear until the sun has attained considerable power, and the harbor is thus annually blockaded from three to four weeks after the Erie harbor is opened.

The commerce of Cleaveland is now greatly more important than that of Erie. Why? Because for some years past, it has been reaping the benefits resulting from the completion of the Ohio canal, which connects the Lake with the Ohio river at Portsmouth, and runs through a populous and fertile country. It has been realizing the harvest which Erie is only anticipating; but which will surely come.

More importance has been attached to this matter than might at the first glance appear to be necessary; not particularly with a view of pointing out or establishing the claims of Erie, but in order that the relative situation and merits of the Erie Extension might be more clearly comprehended.

An impression, which may be said to be almost general, has existed in the eastern part of our own state in favor of the route through Ohio, to the disparagement of the route through Pennsylvania. Having once entertained this prejudice myself, and being convinced of its impropriety, it struck me that a candid examination and exposition of the facts were entirely relevant to the subject matter proper for an annual report.

The distance from Buffalo to New York city by the New York canal is as follows, viz:

363 M. of Canal.	
160 do River.	
523 Miles.	

From Erie harbor to Philadelphia as follows, viz:

Erie Extension and Beaver Division canals,	136	Miles.
Ohio river from Beaver to Pittsburg,	28	do
Western Division canals,	104	do
Portage rail road,	36	do
Juniata and Eastern Division canals to Harrisburg,	142	do
Rail road from Harrisburg to Philadelphia,	107	do
	553	Miles.

From Cleaveland to Philadelphia as follows, viz:

Cleaveland to Beaver, by way of the Ohio canal to Akron, thence by the Cross Cut canal to the junction with the Beaver Division below New Castle, and thence by the Beaver Division,	143	Miles.
Ohio river from Beaver to Pittsburg,	28	do
Western Division Pennsylvania canal,	104	do
Portage rail road,	36	do
Eastern Division Pennsylvania canal to Harrisburg,	142	do
Rail road from Harrisburg to Philadelphia,	107	do
	560	Miles.

Taking the Pennsylvania canal to Columbia and thence by the Columbia rail road, makes the distance on each route five miles greater.

I was unable to procure official data as to the length of the Cross Cut and Ohio canal.

The accompanying tabular statements exhibits in detail the condition of all the works on the Line, showing the amount of work done and the total estimated cost of the Erie Extension.

Should the appropriations be made, so as to divide the whole amount required into nearly equal sums for the two ensuing years, the whole Line can be completed during the year 1841.

Respectfully submitted,

W. MILNOR ROBERTS, *Principal Engineer.*

Engineer's Office, Nov. 25th, 1839.

STATEMENT

Showing the length, Lockage, and total estimated cost of the whole Erie Extension.

	Length in miles.	Lockage in feet.	Cost of work done.	Cost of work to be done.	Total estimated cost of work.
Shenango Line and Conneaut Reservoir,	64	287½	$1,165,593 37½	$493,085 68½	$1,658,679 06
Conneaut Line,	45½	510	264,319 98	1,348,247 47	1,612,515 45
Total,			$1,429,913 35½	$1,841,281 15½	$3,271,194 51

SECTIONS.—SHENANGO LINE, ERIE EXTENSION.

Statement showing the cost of work done, cost of work to be done, together with the total estimated cost of said line.

No.	*Length in ft.*	*Cost of work done.*	*Cost of w'k to be done.*	*Total est'd. cost.*	*Remarks.*
1	5211	$5852 80	none.	$5852 80	Head of sl'kw'r 6 m. above N.Cas. comp'd.
2	4968	10979 26	do	10979 26	Completed canal partly in river.
3	5080	4951 17	do	4951 17	do
4	5184	7434 67	do	7434 67	do
5	5155	7331 09½	do	7331 09½	do
6	5184	5059 90	do	5959 90	do Pulaski,
7	5136	17319 25½	do	17319 25½	do canal partly in river,
8	5216	10518 52¾	do	10518 52¾	do do do
9	5184	5299 40	do	5299 40	do
10	5212	13101 71¼	do	13101 71¼	do do do
11	5184	8715 72	do	8715 72	do do Middlesex,
12	5184	4815 50	do	4815 50	do
13	5400	7495 47	do	7495 47	do
14	4901	9631 37	$379 24	10010 61	Completed since 31st of October,
15	5130	5033 58	none.	5033 58	do
16	5184	8665 42	do	8665 42	do
17	5086	8887 54	621 00	9508 54	Sharon,
18	5184	7373 02	none.	7373 02	do
19	5140	16143 53	1060 49	17204 02	Canal in river, completed since 31st Oct.
20	5120	17600 85	761 82	18362 67	do do do
21	5198	6684 78¾	none.	6684 78¾	Completed,
22	5184	3995 49	do	3995 49	do

SECTIONS—Continued.

No.	*Length in ft.*	*Cost of work done.*	*Cost of w'k to be done.*	*Total est'd. cost.*	*Remarks.*
23	5184	3001 20	none.	3001 20	Completed.
24	5184	18321 37½	do	18321 37½	do
25	5184	13271 55	221 00	13492 55	do since 31st Oct.
26	5184	14096 32	none.	14096 32	do
27	5184	9257 21½	do	9257 21½	do
28	5187	5587 70	do	5587 70	do
29	5184	5095 11½	do	5095 11½	do
30	5184	5450 40	do	5450 40	do
31	5238	5126 55	do	5126 55	do
32	5265	10414 41	do	10414 41	do
33	5184	10139 14	do	10139 14	do
34	5211	5917 76	do	5917 76	do
35	5184	16024 31	0	16024 13	Final 1st contract,
36	"	6985 92½	do	6985 92½	do 2nd do
37	"	5637 92	do	5637 92	do
38	"	12303 11	do	12303 11	do
39	"	5790 86	do	5790 86	do 2nd contract,
40	"	7961 78	0	7961 78	Final.
41	"	9210 74	do	9210 74	do
42	"	8047 90	do	8047 90	do
43	5832	6700 16	do	6790 16	do
44	4536	3932 36	do	3932 36	do
45	5184	5215 28¼	do	5215 28¼	do

46	2592	1886	33½	none.	1886 33¼	Final,
47	4536	4965	83½	do	4965 83½	do end of slackwater lock 26,
48	2322	4094	59	do	4094 59	
49	2592	1070	00	2030 00	3100	
50	"	1224	54	1262 24	2486 78	
51	"	2494	65	100	2594 65	
52	"	1560	85	1320 89	2881 74	
53	"	2900	62	150	3050 62	
54	"	4292	16	"	4292 16	Completed,
55	"	5026	06	"	5026 06	do
56	"	1050	67	2686 77	3137 44	
57	"	2086	11	909 97	2996 08	
58	"	2281	45	35 85	2317 30	
59	"	3898	61	" "	3898 61	Completed,
60	"	729	89	2621 11	3351	
61	"	2067	29	387 11	2454 40	
62	3456	3917	65	1509 21	5426 86	
63	3888	6213	37	3686 98	9900 35	Reservoir—Pymatuming,
64	2592	808	50	9533 60	10342 10	do
65	2592	8840	87½	6061 50	14902 37½	do
66	2592	2863	75	36485 00	39348 75	do crosses swamp,
67	2592	1824	90	7070 95	8[illegible]95 85	do
68	2592	4567		2962 97	7529 97	Pymatuming Reservoir,
69	"	4000		2200	6200	do do
70	3024	5831		669	6500	do do
71	2160	901		2711	3612	

SECTIONS—Continued.

No.	*Length in ft.*	*Cost of work done.*	*Cost of w'k. to be done.*	*Totat est'd. cost.*	*Remarks.*
72	2592	3900 00	600 00	4500	
73	"	800	3080	3880	
74	"	3095	1548	4643	Shermansville,
75	"	284	2216	2500	
76	2214	18937	7863	26800	
77	2160	4132	18231	22363	
78	2364	2454	9746	12200	Junction,
79	3315	2912	9008	11920	Reservoir section,
80	3240	3300	7200	10500	do
81	"	12980	500	13480	do
82	"	8799	833	9632	do
83	3348	6750	750	7500	do
84	2808	2600	3800	6400	Evansburg Conneaut Lake.

LOCKS.

No.	Location.	Lift.	Guard.	Cost of work done.	Cost of work to be done.	Total estimated cost.	REMARKS.
1	On sec. 1	10 ft.		$13175 35	$	$13175 35	Head of New Castle Pool.
2	2	8		14521 69	370 20	14891 89	
3	6	8		12901 53	218 64	13120 17	
4	9	8		12916 27		12916 27	Completed.
5	12	8		13115 85	526 50	13642 35	
6	13	8		13230 07	618 20	13848 27	
7	14	8		11962 12	129 80	12091 92	
8	17	8		12952 45		12952 45	Completed.
9	20	8		13560 49		13560 49	
10	21		7	13720 25	60	13780 25	At Dam No. 1.
11	24	9		19134 58		19134 58	Outlet—completed.
12	26	8		13363 04		13363 04	
13	28	8		11318 30	1080	12398 30	
14	31	2	7	16988 21		16988 21	Dam No. 2—completed.
15	33	7		18416 02		18416 03	Outlet—completed.
16	34	7		10546 76		10546 76	
17	35	7½		11602 08		11602 08	
18	36	7½		12098 52		12098 52	
19	39	7½		11720 29		11720 28	2nd Contract.
20	40	7		13032	34	13066	3rd do
21	43		7	29985 85	908	30894	3rd do

In the cost of Lock No. 21, there is included the cost of excavating the bed of the stream, cost of towing path, bridge abutments and piers, and cut stone water way, &c.

LOCKS—Continued.

No.	Location.	Lift.	Guard.	Cost of work done.	Cost of work to be done.	Total estimated cost.	REMARKS.
22	On sec. 43	7		$10439 87½	$	$10439 87½	2nd Contract.
23		7		6108	9000	15108	do
24	44	4	6	13746 62½		13746 62½	
25	45	6	6	17920		17920	do
26	47	7		10700 09½	10108	20808 09½	4th Contract.
27	49	6⅝		2427 80	9562 20	11990	
28	50			840 71	11149 29	11990	
29	52			4486 19	7503 81	11990	
30	56			3717 68	8272 32	11990	
31	57			7625	4365	11990	
32	57			877 04	11112 96	11990	Owrystown.
33	61			2202 75	9787 25	11990	
34	62			1988 85	10001 15	11990	
35	63	none.	6½	10073 75	3586 25	13960	This includes T.P. bridge across the lock.
36	70	6½		3701	7299	11000	Inlet to Pymatuming Reservoir.
37	71			2335	6655	8990	
38				4446	4504	8950	
39	72			3705	5295	9000	
40				4303	4487	8790	
41	73			3853	5067	8920	
42	75			8874	257	9131	
43				5279	3621	8900	
44	76			3101	7899	11000	

DAMS

No.	Location.	Length.	Height	Cost of work done.	Cost of work to be done.	Total estimated cost.	Remarks.
1	on sec. 21	229 ft.	13 ft.	$11913 89		$11923 89	at Sharp's mill, rock bottom completed,
2	do 31	225	11	17784 94	$372 00	18156 94	Gravel bottom, Big bend,
3	at Greenv'l.	230	7½	8442 26		8442 26	Completed 2nd contract,
4	on sec. 44	210	16	14635 10		14935 10	2nd con. commencement of slackwater,
5	do 45	140	11	3045 00	3500 00	6545 00	Williamson's Mill 2nd contract,

AQUEDUCTS.

No.	Over what stream.	Length.	Clear width.	No. of spans.	Cost of work done.	Cost of work to be done.	Total estimated cost.	Remarks.
1	Piper's run.	101 ft.	34 ft.	3	$6961 96½	$741 28	$7703 24½	
2	Anderson's.	101	34	3	10122 90		10122 90	Completed.
3	Saw-mill.	101	34	3	9305 60		9305 60	do

TOWING PATH BRIDGES.

No.	Location.	Length	No. of spans.	Cost of work done.	Cost of work to be done.	Total estimated cost.	REMARKS.
1	On sec. No. 21	25	1	$490 40	$26 26	$516 66	
2	22	32	1	326 02		326 02	Completed.
3		35	1	344 29		344 29	
4		20	1	813 29⅓		813 29⅓	Stone abutments.
5	32	35	1	1087 26		1087 26	Completed.
6		35	1				Included in Section No. 32.
7	33	20	1	772 52		772 52	Completed
8	43	170	2				Included in estimate of Lock No. 21.
9	1	20	1	762 40	242	1004 40	Stone abutments.
10		30	1		255 60	255 60	Across Lock No. 1.
11	78	100			1250	1250	At Junction.

WASTE WIERS.

No.	Location.	Length of spill.	Cost of work done.	Cost of work to be done.	Total estimated cost.	Remarks
1	on sec. 2	70 ft.	$420 00	$597 13	$1017 13	
2	3	60	40	1077 53	1177 53	
3	8	60	220	949 27	1169 27	
4	10	80	1482 63		1482 64	Completed,
5	12	110	1761 28	51 98	1813 27	
6	12	80	1606 75		1606 74	Completed,
7	15	60	964 20	76 53	1040 73	
8	17	165	1035 36		1035 36	Completed,
9	18	50	580 26	407 16	987 42	
10	20	60		860 16	860 16	
11	26	80	1534 98		1534 97	Completed,
12	30	90		1164 24	1168 24	
13	33	50			Included in estimated cost of lock No. 15,	
14	34	50	1497 00		1497 00	Completed,
15	35	80	1882 07		1882 08	do
16	40	100	2195 64		2195 64	do
17	42	80	2033 58		2033 58	do
18	4	60		563 50	563 50	
19	38	100		1800 00	1800 00	Including repairs of Sec. 38.
20	54	80		800 00	800	
21	60	80		800 00	800	
22	61	80		800 00	800	
23	P. reservoir.	100		3000 00	3000	at Hartstown for reservoir.
24	74	100		1080 00	1080	

No.	Location.	Cost of work done.	Cost of work to be done.	Total estimated cost.	REMARKS.
1	On sec. No. 6	$2206 43	$000 00	$2206 43	At Pulaski—completed.
2	11	2046 32		2046 32	Middlesex, do
3	14	964 10	957 12½	1920 22½	
4	16	1882 44	137 55	2019 99	
5	17	1106 40	994 98	2101 38	At Sharon.
6	20	780 00	959 61	1739 61	Sharp's Mill.
7¼	26	156 00	2228 9	2384 94	At Clarkesville.
7	35	1503 35		1503 55	Aqueduct No. 3—completed.
8	40	2031 80		2031 80	Lock " 19—completed.
9	At Greenville.	3383 45		3383 48	
9½	do		1000 00	1000 00	100 feet long.
10	On Sec. 44		720 00	720 00	At Dam No. 4.
11	45	1539 49½	2560 00	4099 49½	Across Shenango at dam No. 5,—3 spans 60, 140 and 60—260 feet long.
12	50		1750 00	1750 00	
13	52		1750 00	1750 00	
14	54		1750 00	1750 00	
15	57		1750 00	1750 00	
16	74		2000 00	2000 00	Truss 54 feet span.
17	77		650 00	650 00	Lattice 100 do
18	79		1000 00	1000 00	Truss 54 do
19	84		14000 00	14000 00	Lattice 100—at Evansburg across outlet Conneaut Lake. This includes 60,000 yds. emb.

FARM BRIDGES.

No.	Location.	Cost of work done.	Cost of work to done.	Total estimated cost.	Remarks.
1	on sec. 1		$1423 60	$1 423 0	Stone abutments,
1	2	$40 00	482 40	522 40	
1	3		714 75	714 75	Heavy embankment,
1	4		621 40	621 40	do
1	5	30 00	586 20	616 20	do
1	9		681 44	681 44	do
1	10	27 00	604 29	631 29	do
1	12	60 25	414 75	475 00	
1	13	400 00	106 32½	506 32½	
2			477 00	477 00	
3			595 90	595 90	
1	14		622 89	622 89	
2	14	72 00	465 55	537 55	
1	15		529 86¼	529 86¼	
2			493 00	493 00	
3			482 19	482 19	
1	16	641 72	209 46	851 18	Heavy embankment,
1	17	551 81		551 81	Completed,
1	18	596 74		596 74	do
1	24	703 79½		703 79½	do
1	26		835 80	835 80	
2		1141 53		1141 53	Completed,
1	27		506 00	506 00	

1	on sec. 28	554 40	20 00	574 40	
2		506 90½	60 00	566 90½	
1	29	474 60	100 00	574 60	
1	30	834 41		834 41	Completed,
2	30	21 00	546 60	567 60	
1	31		1330 88	1330 88	Stone abutments,
1	33		2088 88	2088 88	do & heavy embankmen',
1	36		500 00	500 00	
2			500	500	
3			500	500	
4			500	500	
1	37	293 00	207	500	
2			500	500	
1	38		500	500	
1	39	360 00	140	500	
1	41		500	500	
1	43		500	500	
2	38	644 40	105 60	750	Heavy embankment,
2	39		500	500	
1	53		500	500	
1	58		500	500	
1	60		500	500	
1	61		500	500	

LOCK HOUSES.

No.	At what Lock.	Cost of work done.	Cost of work to be done.	Total estimated cost.	REMARKS.
1	Lock No. 1	$20 00	$977 50	$997 50	
2	2		1000 00	1000 00	
3	3	897 00	1120 00	1017 00	
4	4	300 00	600 00	900 00	
5	5	50 00	850 00	900 00	
6	6		1000 00	1000 00	
7	7	400 00	540 00	940 00	
8	8	1013 24	00	1013 24	Completed.
9	9		960 00	990 00	
10	10	150 00	870 00	1020 00	
11	11	200 00	850 00	1050 00	
12	12	1010 00	00	1010 00	Completed.
13	13	300 00	675 00	975 00	
14	14		975 00	975 00	
15	bet. 15 & 16		975 00	975 00	
16	Lock 17		785 00	785 00	
17	18		800 00	800 00	
18	19		250 00	750 00	
19	20	500 00	550 00	750 00	
20	21	200 00	00	859 00	
21	23	850 00	750 00	750 00	
22	24		750 00	750 00	
23	25		750 00	750 00	

24	On sec. 26	$750 00	$750 00	REMARKS.
25	bet. 27 & 28	700 00	700 00	
26	Lock 29	700 00	700 00	
27	30	700 00	700 00	
28	31	700 00	700 00	
29	bet. 32 & 33	700 00	700 00	
30	Lock 34	700 00	700 00	
31	35	700 00	700 00	
32	36	700 00	700 00	
33	bet. 37 & 38	700 00	700 00	
34	Lock 39	700 00	700 00	
35	40	700 00	700 00	
36	41	700 00	700 00	
37	42	700 00	700 00	
38	bet. 43 & 44	700 00	700 00	

CONNEAUT RESERVOIR CLEARING.

Section No.	No. of acres done.	Price per acre.	Cost of work done.	No of acres to be done.	Cost of work to be done.	Total No. of acres.	Total estimat'd cost.
1	40	$35	$1400 00	8	$280 00	48	$1680 00
2	35	25	875	5	125	40	1000
3		22 5		69	1552 50	69	1552 50
4	31½	40	1260			31½	1260
5	30	25	750	40	1000 00	70	1750
6	67	40	2680	6	240	73	2920
7		25		70	1750	70	1750
8	50	40	2000	24	960	74	2960
9	60	40	2400	12	480	72	2880
10	37	40	1480	3	120	40	1600
11	55	35	1925	18	630	73	2555
12	38	30	1140	12	360	50	1500
13		28		50	1400	50	1400
14	65	19	1235	5	95	70	1330
15	42	35	1470	3	105	45	1575
16	48	40	1920	2	80	50	2000
17	35	39	1365	5	195	40	1560
18	40	25	1000	20	500	60	1500
19	12	25	300	66	1650	78	1950
20	44	32	1408	4	128	48	1526
21		2375		48	1140	48	1140
22	80	35	2800			80	2800

23	40	35	1400			40	1400
24	45	35	1575			45	1575
25	27	30	810	13	390 00	40	1200
26	44	39	1716			46	1716
27		23		70	1610	70	1610
28	35	33	1155			35	1155
29	34	40	1360	1	40	35	1400
30	5	25	125	7	175	12	300
31	16	27	432			16	432
32	25	36	900	5	180	30	1080
33	52	35	1820	26	910	78	2730

RECAPITULATION.

Nature of work.	Cost of work done.	Cost of work to be done.	Total estimated cost.
84 Sections.	$540809 85½	$152212 70	$693022 55½
44 Locks.	436068 11¼	143477 98½	570946 09¾
5 Dams.	55821 19	3872 00	59693 10
3 Aqueducts.	26390 46½	741 28	27131 74½
11 Towing path bridges.	4596 18⅓	1773 86	6370 04⅓
24 Waste wiers.	17253 75½	14031 49½	31285 25
21 Road bridges.	17600 01½	34207 20½	51807 22
46 Farm bridges.	7953 56	21951 76¾	29905 32¾
38 Lock houses.	5899 24	25577 50	31476 74
Fence.	4500	2500 00	7000 00
Clearing Conneaut reservoir.	38701	16095 50	54796 50
	1155593 37½	416441 29¼	1572034 66⅝
Add for repairs, protective walls, &c.		15000 00	15000 00
do Contingencies, 10 per cent.		41644 39¼	41644 39¼
do Engineer corps.	10000 00	20000 00	30000 00
	$1165593 37¾	$493085 68½	$1658679 06¼

FENCE.

9000 Perches made,	at	50 cts.	4500
5000 do	to be made,		2500
Total, 14000 do	Total cost,		$7000

TOTAL LOCKAGE, 287½ feet.

Length of canal, 56½ miles.
do slackwater, 7½ do
Total do line, 67 do
Including 4 miles on Conneaut reservoir, extending towards the Feeder dam.

[No. 31.]

Report of W. K. Huffnagle, Engineer, Gettysburg Rail Road.

GETTYSBURG EXTENSION.

A detailed report upon this work, having been submitted to the board in May last, the undersigned deems it unnecessary to recapitulate the matters therein contained, but will proceed to give a general description of the work, and its present condition.

The report above alluded to, consisted principally of remeasurements of the several sections of graduation, and such portion of the mechanical work as were accessible. No great difference has resulted from the remeasurement; the principal amount will be in the non-acceptance of contracts relet, contrary to law, which if estimated at the original prices, will reduce the estimate of the late Engineer in the amount of nine thousand one hundred and three dollars and twenty-eight cents; the extra allowance made by the late board upon sections No. 19 and 20, amount to thirteen thousand one hundred and seventy-two dollars and sixty-four cents; which cases, are still subject to the action of the board. Much labour having been expended upon this work, subsequent to the last estimate of the late Engineer, the present measurement in many instances exceeded that estimate.

The length of that portion of the road upon which grading has been commenced, is twenty-two miles upon which the grades vary from ten to fifty feet per mile, and the curvature from a radius of nine hundred and ten feet, to one of thirty thousand two hundred and fifty-four feet. This division commences at the summit of the South mountain, in a depression called Ripple's Gap, and extends to Gettysburg.

The graduation which has been completed, forms an unconnected distance of seven and a half miles. The work was commenced in November, 1836, and prosecuted, until the month of March last. The amount of work done is

Upon graduation,	$543,839 91
" masonry,	76,113 05
" fencing,	2,866 65
Amount,	$622,819 61

The whole amount of money appropriated to this work, has been six hundred and fifty-six thousand six hundred and sixty-six dollars and sixty-seven cents; of which, one hundred and fifty thousand dollars has not been received. This will in all probability be sufficient to discharge all the liabilities of the commonwealth. It is believed that all

just claims upon the commonwealth for this work, are embraced in the following statement:

Amount due for graduation,		$124.785 34
"	masonry,	17,936 57
"	fence,	1,010 75
"	former Engineers,	529 50
"	corps of present Engineers employed in remeasurement,	481 00
"	Superintendent,	300 00
"	for office rent,	168 00
"	Stationary, fuel, &c.	96 62½
		$145,307 78½

The difficulties attendant upon monetary affairs, has prevented the negociation of the loan of one hundred and fifty thousand dollars, to be devoted to the liquidation of the above claims. None of the contractors have received any portion of the amount due them, at the last estimate, many being obliged to pay usurious interest, which consequently subjects them to serious loss. The arrangements are all completed, necessary to pay off and settle all accounts connected with this work, as soon as the appropriation is received. The only portion of the mechanical work remaining unfinished and in an unprotected state, at the time the undersigned was appointed to this work, was the culvert at Toms creek, and the Myers mill road. The construction of the railway at these points having abridged the ordinary privileges of the inhabitants in the vicinity. The board directed them to be put in a state of preservation, and finished so as to afford the usual facilities. The culvert at Toms creek has been protected as directed, and the road underneath finished by a heavy pavement being laid throughout of good sized stone, laid edgewise and well gravelled. This will form a suitable roadway and protect the foundation of that work from destruction. The road at Myers mill has been completed in a satisfactory manner. The race way has been permanently covered, and the necessary measures for the protection of the masonry have been taken. The remainder of the mechanical work has been placed in a state of preservation.

The inutility of the completion of this project having been decided, it becomes unnecessary to refer to its demerits, or add a single argument to the many advanced in condemnation of it. The only regret which arises is, that such a useless expenditure of the public funds has taken place upon a work from which no advantage could ever be derived, and which, if completed, would have ever proven a sinking fund to the commonwealth.

Respectfully submitted.

W. K. HUFFNAGLE, Engineer.

[No. 32.]

Report of C. L. Schlatter, Engineer on the surveys for a continuous Rail-Road from Harrisburg to Pittsburg.

SURVEYS.

To the President and Board of Canal Commissioners of Pennsylvania.

GENTLEMEN:

The survey for a continuous rail-road, from Harrisburg to Pittsburg, which was entrusted to my charge on the 1st of August, 1839, is so far advanced as to enable me to make the following preliminary

REPORT.

Immediately after having received my appointment, I proceeded n accordance with a provision of the act, authorizing the survey, ito appoint three principal assistant engineers, to whom were assigned respectively the three routes to be examined between Harrisburg and Pittsburg; for although no other points were designated, (thus leaving to the board, and the engineer the selection of one or more routes to be surveyed,) yet, the inference drawn by the board and myself, deduced from that part of the act which directs that three principal engineers should be appointed, was, that a Northern, Middle and Southern route were to be surveyed; acting upon this inference, the several corps were formed, and detailed upon the examinations necessary to ascertain which of these routes would prove most favourable.

After a consultation with the president of your board, it was deemed advisable, as the season was far advanced, to commence the surveys of the Northern and Middle routes on the crest of the Allegheny mountain, so that the engineer might be enabled to report during the present year, upon the practicability of passing that great barrier between the Eastern and western sections of our state, without having resource to inclined planes, and by gradients adapted to the application of locomotive power. It was also determined at the same time to commence the survey of the southern route at Pittsburg, and proceed towards Chambersburg as far as the season would permit, as a portion of the line, say thirty miles from Pittsburg to the head waters of the Crabtree, and forty miles to the passage of the Loyalhanna, would form a junction with the surveys, both for the Northern and Middle routes.

I would beg leave before entering upon a description of the routes surveyed, to make a few remarks relative to the manner in which I intend to adjust the gradients on the several lines, so as to conform in the best possible manner, with the face of the country to be traversed by the rail-road, and to retain the proper connection, both with regard to grades and curvatures, with the rail-roads now in operation between Harrisburg and Philadelphia.

On the Columbia Rail-Road, the maximum grade, is forty-five feet

per mile, carried around curves of less than one thousand feet radius. On this road the average power of the heavy class of engines used for the burthen trains, is from one hundred and fifteen to one hundred and twenty tons gross. These engines weigh from eleven to twelve tons, and easily perform their trips at the rate of from ten to twelve miles per hour. As it would be a great desideratum to pass trains of this great weight over the whole line of rail-way from Philadelphia to Pittsburg, without dividing them; I have directed the surveys on the Middle and Northern divisions to be made with the view to establish grades in no place exceeding forty-five feet per mile, and, wherever the line should be forced into curves of less than one thousand feet radius, the grades to be reduced in such a manner, as to equalize the tractive power of the engine. It gives me great satisfaction to state, that on the Northern route, sufficient data have been obtained to establish the fact that the Allegheny mountain may be surmounted with grades arranged as above described, both on the Eastern and Western side; from Emighs Gap to the Bald Eagle on the one side, and the waters of the Moshannon on the other; and that upon the Middle route a favorable line has been traced along the Eastern slope of the mountain, from which it has been ascertained that a descent may be effected with a grade of forty-five feet per mile, from the summit to the valley of the little Juniata. The limits of our time did not permit us to make a full examination of the Western side, but from reconnoissances directed from the summit of the mountain, to the head waters of the Clearfield, Conemaugh, and Blacklick, we have every reason to believe that our instrumental examinations next season will prove successful.

On the southern route, the line traced from Pittsburg to Laughlinstown (53 miles) was found to be particularly favorable, both with regard to grades and curvatures, and very direct in its course to Chambersburg, not exceeding in length the turnpike road between Pittsburg and Laughlinstown—one third of the distance will be level, one third with grades from ten to thirty feet per mile, and one third with grades between thirty and forty-five feet per mile—these gradients are actually traced upon the ground, but from data obtained, I have no doubt but that the line may be materially improved by reducing the grades, so that for a distance of fifty miles from Pittsburg to Ligonier, they will in no place exceed forty feet per mile.

After investigating carefully the report and maps of the survey made in 1838 by Hother Hage, Esq., Civil Engineer, for a continuous Rail Road from Chambersburg to Pittsburg, I was convinced that any attempt to trace a route between Laughlinstown and Louden with grades not exceeding forty-five feet per mile, would be attended with great expenditure of time and money, and in the end, prove entirely useless; for, although we know that such a line could be found by following to their heads the courses of the ravines that break into the side of the mountain, and by returning on the opposite side to their commencement, gain the distance necessary to carry out the grade; yet the increased length of such a line would render it

almost valueless, and the expense and time that would be required for transporting passengers and freight over so extended a line of rail-way would more than counterbalance any advantage gained by the lightness of the grades.

The ridge which extends from the base of Laurel Hill, to that of the Allegheny mountain, dividing the waters which flow into the Conemaugh from those tributary to the Youghiogeny, is nine miles in a straight line from Laughlinstown to the point where it is reached by the line of the rail road survey of 1838. The distance by the line surveyed for the rail road between the same points is thirty-six and a half miles, and the grades obtained vary, say from twenty to sixty feet per mile. This great increase of distance called for a minute examination of Laurel Hill, in order to discover, if, by allowing heavier grades (predicated upon the supposition that assistant locomotive engines would be used) a shorter and less expensive route might not be discovered. The lateness of the season confined our attention altogether to the western side, and although several lines were traced from the base to the summit, none furnished sufficient data upon which to predicate the gradients and course of a route which could be recommended with any degree of certainty. The examinations of this year, however, have been so far extended as materially to assist the location of the line next season.

I would here beg leave to offer for the consideration of the Board, the plan by which I propose to effect the passage of Laurel Hill, and the mountains between it and Chambersburg.

The surveys of 1838 for a continuous rail road across these mountains in connection with the examinations made this season on the western side of Laurel Hill, prove the inexpediency of locating a line with the assumed maximum grade of forty-five feet per mile, across mountains whose heights and peculiar formation would render it necessary, in order to preserve this grade, to increase the length of the road to such an extent as entirely to neutralize the advantage gained by this rate of inclination. I therefore propose to shorten those divisions of the road crossing the mountains, by locating the line with such increased gradients, as shall render the tractive power necessary to pass a full train, double that which will be required on those parts of the rail-way where the grades do not exceed forty-five feet per mile.

As it is my intention in a further report to enter minutely into the details of the difference between the cost of working a short line with heavy grades, and a lengthened line with light grades, I will here close my remarks, and as briefly, as is consistent with so important a subject, give a general description of the several routes which have been surveyed, reserving for a future report more minute details; when the estimates, profiles and maps, which are now rapidly progressing under my direction, shall be completed.

NORTHERN ROUTE.

Many surveys will necessarily be made before the proper course of this route can be determined upon. For, although one route may be found to have an increase of distance over another, yet the diminished rise and fall, combined with more favorable grades and curvatures, may, upon comparison, after the routes have been carefully surveyed, and all the requisite data obtained and examined, prove the longer route to possess superior advantages over the shorter.

The following general description embraces the several surveys which have been suggested for consideration, and may be properly classed under the head of the Northern Routes.

No. I. West Branch—commences at Harrisburg, and following up the valley of the Susquehanna to that of the West Branch, passes up the West Branch to its head waters; thence crossing the summit between the Cushing and Two Lick creeks, descends the valley of the latter to its junction with the Black Lick, and thence to Blairsville; from which point several routes will be surveyed to Pittsburg; but that upon which are predicated the estimated distances of the lines mentioned under the head of the northern route, crosses the Conemaugh a short distance above Blairsville, ascends Stony Run, crosses the dividing ground between the Conemaugh and Loyalhanna, descends M'Clellan's Run, and crosses the Loyalhanna above New Alexandria; thence up the Crabtree to where it interlocks with the head waters of Brush Creek, and by the valleys of Brush Creek, Turtle Creek, and the Monongahela River to Pittsburg. The highest summit upon this route will be * one thousand six hundred and eight feet above tide water, and the distance estimated at three hundred and forty-five miles.

No. II. Clearfield leaves No. I at the mouth of Clearfield creek, and by its valley, passes to the summit between its head waters to those of the north fork of the Black Lick, thence meeting No. 1, descends the valley of the Black lick to Blairsville. A variation of this route is proposed, which passes by the head waters of Chest creek to the head waters of a branch of the Black lick, and thence to Blairsville. The highest summit crossed upon the first division of this route, will be 1996 feet above tide, and upon the second division, 1912 feet—the distance of both being three hundred and seventy-four miles.

No. III. Beech creek leaves the West Branch at the mouth of the Bald Eagle creek, and passes its valley to the mouth of Beech creek up Beech creek to its source, and thence, descending along the western escarpment of the Allegheny mountain, crosses the Moshannon creek about twelve miles above Phillipsburg, and thence reaches the Clearfield creek by a favorable depression on the dividing ground

* The heights of the summits (excepting that at Emigh's Gap,) have been assumed from the surveys made in 1825 by Messrs. Rawle and Mitchell, and the distances computed from the best information I could obtain.

between it and the Moshannon, where the line of survey will join No. 2.

The height of this summit has not yet been ascertained. The length of the route is estimated at three hundred and twenty miles.

No. IV. Bald Eagle diverges from the west branch at the same point as the preceding, and passes up the valley of the Bald Eagle to a gap in the Allegheny mountain, known as Emigh's gap, and thence following the western slope of the mountain, joins No. 3 at the passage of the Moshannon. The height of this summit is 2043 feet above tide, and the distance estimated at three hundred and fifteen and a half miles.

No. V. Bald Eagle and Nittany valley leaves the Susquehanna at the mouth of White deer creek, and proceeding up the valley of this stream, passes through the Nittany mountain at the T spring, head of Big Fishing creek—thence descending on the slope of the Nittany mountain, and by the ridge skirting Little Fishing creek, to the Table Land of Nittany valley, and thence through Spring creek gap, in the Muncy mountain, to the valley of the Bald Eagle creek, where the line would unite with No. 4 at or near Milesburg. The height of the summit would be the same as in the preceding route. The distance estimated at two hundred and ninety-five miles.

No. VI. Penn's valley leaves the Susquehanna at Selinsgrove, and following the valley of Penn's creek, passes through the highly cultivated region on its borders, and by the towns of Earlysburg, Bolesburg, Pinegrove, Gatesburg and Warrior Mark, to the junction of the Little Bald Eagle with the Little Juniata—thence by the valley of the first named stream to the vicinity of Hannah furnace, where it unites with No. 5, and passes westward by the same route. The summit will coincide with Nos. 4 and 5, and the distance is estimated at two hundred and ninety miles.

No. VII. There is still another route by which it is proposed to join a portion of the middle route with the northern, by following the Susquehanna from Harrisburg to the mouth of the Juniata, thence along the valley of the Juniata to the town of Petersburg—thence by the valley of the Little Juniata to the confluence of the Little Bald Eagle, and by the valley of the latter to Hannah furnace, where it unites with No. 4. The estimated distance of this route, is two hundred and eighty-eight miles.

The following table exhibits the names, elevation of summits above tide, and the length of the lines to be surveyed to establish the northern route:

Names of Route.	Names of principal summit.	Estimated Elevation of summit above tide in feet.	distance in miles from Harrisb'g to Pittsb'g.
No. I. West Branch,	Cushing and Two Lick,	1608	345
II. Clearfield,	Clearfield & Conema'gh,	1996*	374
III. Beech creek,	Head of Beech creek,	unk'wn.	320
IV. Bald Eagle,	Emigh's gap,	2043†	315½
V. Bald Eagle & Nittany,	do.	2043	295
VI. Penn's valley,	do.	2043	290
VII. Bald Eagle & Juniata,	do.	2043	288

[*Reduced 220 feet, by a tunnel one mile in length.]
[†Reduced 40 feet by a cut.]

Of these routes, seventy-five miles have been instrumentally examined during the past season, the whole of which is common to routes Nos. 4 and 5, and twenty-one miles is common to Nos. 6 and 7, comprising the passage of these routes over the Allegheny mountain.

From the above tabular statement, it will be seen that the routes to which our attention was called were numerous, and as many of them appeared equally balanced in respect to their several advantages, it became difficult to decide upon which to commence, in order to collect the greatest amount of information during the short season which remained for field operations. In our researches for facts and data upon which to found an opinion to this effect, we were materially aided by Judge Burnside, John Mitchell, Esq., and General M'Cullough, whose extensive acquaintance with this portion of the State, rendered the information furnished by them of the highest importance.

My attention having been directed to Emigh's Gap as the most southern depression of note in the mountain within the district assigned to the northern route, the survey was commenced on the 3rd of September 1839, by Mr. J. C. Stocker, Principal Assistant Engineer.

From this point the Line was traced in a southeasterly direction along the slope of Emigh's Gap for three and-a-half miles, where it reaches the eastern side of the mountain, down which the Line descends with a grade of forty-five feet per mile in a northeasterly direction. For the first five miles from the summit, the side of the mountain is indented with deep chasms, caused by the mountain streams which run with rapid descent towards the valley below. The principal of which are Millar's Great and Little Gaps, and that of Emigh's Run. In crossing these ravines, viaducts of considerable elevation will be required.

The Line then continues in the same general course, crossing the heads of Merrimans' Run, Sharas' Run, Elders' Run, Little Laurel, Williams', Glens', and Dicks' Runs, and others of less magnitude. All those above mentioned, must be crossed by high viaducts, and some of them of great length.

At Sharas' Run, the spurs commence, which project from the main body of the mountain towards the ridges which traverse the valley, and six tunnels (varying from six hundred to sixteen hundred feet in length) will be required between Sharas' Run and Dicks' Run, to keep the Line in as direct a course as the rough and broken ground over which the route passes will permit.

From Dicks' Run, the Line was continued in the same direction, crossing Dewitts', Alexanders', Wallis' Run, and several others of minor importance, with viaducts of various heights until the Bald Eagle was attained at a distance of three quarters of a mile above Milesburg, and thirty-eight miles from Emighs' Gap.

From this point, the Line was carried on the southern side of the Creek, crossing the Spring Creek above the town of Milesburg, and the canal of the "Bald Eagle and Spring Creek Navigation Company," immediately below Lock No. 4. Thence the line was continued along the gentle slope of the Muncy mountain to a point five and-a-half miles below Milesburg.

Upon this route the Line was traced with a level grade six miles four thousand three hundred and twenty feet, from Elders' Run to the west fork of Glens' Run, as it was supposed by keeping up this level, the Line could be carried along the slope of the mountain at such a height as to enable us to cross the spurs at their most favorable points; at the same time, by crossing the more important streams nearer their source the viaducts and embankments would be diminished in their length and height, whilst sufficient distance would be left, after passing these streams, to descend into the valley of the Bald Eagle in a very direct course to the vicinity of Milesburg. In this expectation we were disappointed, the ridges being much higher, and the ravines formed by the stream at their source much deeper than was anticipated, causing the Line to be tortuous, independently of possessing other features decidedly objectionable. I therefore directed the examination of another route, with the view of carrying the Line to the Muncy mountain, on the southern side of the Bald Eagle Creek at the nearest practicable point from the summit. For this purpose surveys were commenced at Elders' Run, continued down the valley of that stream, and passed to the head waters of Weisers' Run, by a depression in the ridge dividing the two streams. Thence down the valley of Weisers' Run the Line was traced around the ridges to a favorable point for crossing Sharas' Run, down the valley of which the Line was carried to the flats of the Bald Eagle Creek, and the side of the Muncy mountain, at a distance of twenty and-three quarters of a mile from the summit, and about three quarters of a mile above Hannah Furnace.

Upon this route but two tunnels would be required, the longest of which would be eight hundred feet in length, and but four viaducts of consequence, none of which would be of the most expensive description. The general character of the work on this route, is in fact not different from that incidental to all mountainous regions.

Arrived at Muncy mountain the Line may be carried either by the

valley of the Bald Eagle in the direction of routes Nos. 3, 4 and 5, or by that of the Little Bald Eagle in the direction of routes Nos. 6 and 7.

The Muncy mountain extends from the point where the surveys were closed for the season, forty miles in a northeasterly direction to the West Branch of the Susquehanna, and ten miles in an opposite direction to Logans' Narrows, presenting an almost unvarying slope of about six degrees from its base, to at least two hundred feet vertical height and affording the greatest facilities for the economical formation of the road bed.

Impressed with the importance of being in possession of sufficient data to enable me to report upon the practicability of passing the Allegheny mountain at least at one point on the Line of our surveys during the past season, I personally made a survey from Emighs' Gap to the Moshannon Creek, which fully established the fact that this stream may be crossed at the point most favorable for passing the dividing ground between it and the Clearfield, by following the western slope of the Allegheny, and descending with a grade of forty-five feet per mile. For the means of making this survey I am indebted to the kindness of Hardman Philips, Esq., who loaned me the necessary instruments, and to Thomas Bagshaw, Esq., who volunteered his services as an assistant, which were rendered in the highest degree valuable from his thorough knowledge of the topography of the country, and his accuracy as a surveyor.

MIDDLE ROUTE.

The surveys for this route coincide with those for the northern route, from Harrisburg to Duncan's Island, where, diverging from the Susquehanna, the surveys will be carried up the Valley of the Juniata to Petersburg. From this point two routes will be examined, crossing the Allegheny mountain at different summits, and joining at or near Blairsville on the Conemaugh. These will be designated as the Little Juniata route, and the Sugar Run route.

The first of these leaves the Juniata river near Petersburg, and ascending the valley of the Little Juniata by the Northern slope of the Brush mountain, to the gap near the junction of the Little Bald Eagle creek with the Little Juniata, crosses the Little Juniata, and ascending the Allegheny mountain with a grade of 45 feet per mile, passes the summit either at Kittaning gap, or at a gap two miles South of it, formed by the South branch of Burgoons run. Thence descending the Western slope of the mountain, reaches the dividing ground between the Conemaugh and Black Lick, where the surveys will join No. 2, of the Northern route, in the vicinity of Ebensburg, and thence proceeding by the Black lick to Blairsville, crosses the Conemaugh, and follows the course described in No. 1, of the Northern route, to Pittsburg. The distance from Harrisburg to Pittsburg by this route is estimated at two hundred and sixty-five miles, and the height of the summit reduced by a tunnel 2000 feet long, will be 2268 feet above tide.

A branch survey will be made from Blairsville to Pittsburg by the valleys of the Conemaugh, Kiskiminitas, and the Allegheny river.—The distance estimated by this route from Harrisburg to Pittsburg, is two hundred and eighty miles.

The Sugar run route starts from Petersburg, and following the South side of Brush mountain, crosses Burgoons run, ascends the mountain by the valley of the Sugar run, passes through the gap, descends the valley of the Conemaugh to the foot of Plane 2, on the Portage Rail Road, making use of that rail road to a point a short distance beyond the viaduct at Horse-shoe bend, descends to the level of Johnstown, with a grade of 40 feet per mile, and following the valley of the Conemaugh, joins the Little Juniata route at Blairsville.

The heighth of this summit when reduced, will be 160 feet below Blairs, and 2128 feet above tide.

A branch from this route has been submitted for consideration, which leaves the Conemaugh at Laurel hill, and following its base to Ligonier, meets the Southern route fifty miles from Pittsburg.

Another branch survey leaves the Sugar run route near the viaduct at Horse-shoe bend, and ascending the valley of Salt lick run, meets one of the heads of the Black lick (near the northern turnpike,) by which it joins the routes passing by the Black lick to Blairsville.

S. Moylan Fox, having been appointed principal assistant Engineer, to conduct the surveys for this route, commenced field operations on the 29th of August, 1839, by running a crest line northwardly along the Allegheny mountain, from the summit of the Portage rail road at Blairs gap. This was done for the purpose of ascertaining the relative height, distances, and other data connected with the different gaps in the mountain north of Blairs gap, and which could be used in crossing the mountain by any line that would overcome its elevation by grading along its sides.

From the numerous examinations which had been already made by eminent Engineers, with a view to the location of the present Portage rail road, and whose documents we had in our possession, it was tho't most advisable to make examinations to the north, that being in a measure unexplored ground, and the valley of the Little Juniata, offering a favorable opportunity for grading down from the mountain.—On the Western side the most promising route that presented itself was that by the dividing ridge between the Conemaugh and Clearfield creeks, to the valley of the Black lick. In order to gain this ridge, it would be necessary to have more grading distance than could be obtained from Blairs gap; and the gaps south of it, though more distant, are much more elevated.

The gaps of importance which were found in the course of the survey occurred in the following order:

The first north of Blairs, is that made by the Sugar run; it is 38 feet below Blairs gap, and two miles from it measured on the crest line.

At this gap both sides of the mountain are steep, and afford great facilities for tunnelling. A tunnel 2000 feet in length, will reduce the summit 160 feet below Blairs gap.

A reconnoissance from this summit renders it doubtful whether there will be found distance enough on the Western side, between it and the Conemaugh summit to admit of a reasonable grade, as the Sugar run summit when reduced by a tunnel, is at least 140 feet above the Conemaugh summit, and not more than two miles from it. The ground on the Eastern side appears also unfavorable, the base of the mountain being at least 1100 feet below, and no leading ridge over ten miles in length occuring which could be taken advantage of in the descent.

The next gap in order is that formed by the South branch of Burgoons run, which was found to be 39 feet above Blairs gap, and four and one third miles from it. The distance from this gap to the Conemaugh dividing ridge, is five and a half miles, measured along the side of the mountain, which affords an excellent opportunity for grading. A tunnel 2000 feet in length at this place, reduces the summit 60 feet below Blairs gap.

Burgoons gap is formed by the Northern branch of Burgoons run, and has very nearly the same elevation as the preceeding, from which it is distant about half a mile. It is too wide, and too wet to admit of tunnelling.

The next gap is formed by the Kittaning run, from which it receives its name. This was found to be 35 feet above Blairs gap, and is six and a half miles north of it. The formation of the gap presents a favorable opportunity for tunnelling, and the summit may be reduced by this means 100 feet. An examination will be made with the view of crossing at this point, as its distance, seven miles from the Conemaugh dividing ridge, affords facilities for grading down to it, and on the Eastern side the ground appears very favorable for a descent to the Juniata, by a grade of 45 feet per mile. The only gap discovered of any importance north of this, is Dry gap, which was found to be ten and a half miles from, and 28 feet above Blairs gap, but too wide for tunnelling, and too far north to be of use to the line we were about to survey, on either side of the mountain.

Having ascertained the position and heighths of the different gaps for fifteen miles north of Blairs gap, the examinations were directed to the dividing ridge between the Big and Little Juniata's, to ascertain the practicability of making use of this ridge in the passage from the Allegheny to the Brush mountain, which bounds one side of the valley of the little Juniata, and from its very regular formation, presents great facilities for grading down its side, to the level of that valley.—This examination discovered that the lowest point of the Juniata dividing ridge was 1168 feet below Blairs gap summit, and 1008 feet below Sugar run, whilst the distance from Sugar run summit was but sixteen

miles, not affording the requisite distance to effect a descent with reasonable grades. Under these circumstances, it was concluded to cross the ridge, and endeavor to reach the valley of the Little Juniata by one of the spurs from the mountain, which divide the waters of the different streams emptying into it. A line was therefore commenced from a point on the Juniata dividing ridge, twelve miles from Sugar run summit, and 490 feet below the reduced heighth, with the intention of crossing the mountain at that gap with a grade of 45 feet per mile. This line was continued seven and three quarter miles to Burgoons run, where the valley of that stream presented so formidable an obstacle to the further progress of the line, that we were obliged to abandon our intention of crossing at Sugar run summit, and to continue the line up Burgoons run. A change of grade to 52.80 feet per mile was made to suit the decreased distance, and with this the line was carried across the mountain by the gap of the Southern branch of Burgoons run. The line was then taken up at a point on the above mentioned grade line, to ascertain the possibility of descending from the Juniata dividing ridge to the valley. Following the base of the mountain the line passed through McPherson's hill, (a spur of the Allegheny) by a tunnel 1800 feet long, thence down the valley of Harman's run, crossing the dividing ridge between that stream and Elk run, and crossing Elk run, the surveys terminated for the season near Laurel run, at an elevation of 120 feet above the water of the little Juniata.

The only extraordinary difficulty encountered on this grade line, was at the point of intersection with Burgoons run, where the Kittanning run empties into it. The waters of this last stream, have formed a deep and narrow ravine, which must be crossed by an expensive bridge on the route surveyed. This crossing, it is believed, can be avoided, and the route in other respects materially improved, by carrying the line up the valley of the Kittanning creek, and either crossing the dividing ridge between that valley and Burgoons, or crossing the mountain at the Kittanning summit. This line, and a line from the gap formed by the Southern branch of Burgoons run, will be surveyed next season, with a continuous grade of 45 feet per mile, which it is believed will greatly improve the line, and will avoid the tunnel at McPhersons hill, and the viaduct across Elk run. The remaining part of the line having been located on a steep side hill, the change will make no difference of importance in the location on the rest of the survey.

There are some striking peculiarities in the formation of the ground over which the surveys have been carried, which will materially assist the location of the line in a generally favorable direction toward the point desirable to be attained in the valley of the Juniata. All the spurs of the mountain forming the dividing ground between the different streams crossed by the line, are lower immediately at the mountain, than at any other point between it and their termination. Owing

to this, we have been enabled to cross these ridges with the line, and to avoid the curvatures that would necessarily be adopted in passing around them.

Upon the whole, the result of the examinations has proved satisfactory, and much more favorable than was anticipated, and I am now convinced of the practicability of obtaining a very direct line in the passage from the summit of the Allegheny mountain to the valley of the Little Juniata, and with gradients not exceeding 45 feet per mile.

Fifty-seven miles were instrumentally examined on this route, of which twenty-three were crest lines, and thirty-four miles upon the line for the rail road.

The following table exhibits the the heights of the gaps on the Allegheny mountain, above Sugar Run Gap, and above tide, with their distances from Blair's Gap, traced on the Crest Line surveyed this year.

Name of Gap.	Above Tide.	Above Sugar Run.	Distance from Blair's gap in miles and feet on the Crest line.		Summit reduced by a tunnel 2000 feet long.	
			Miles.	Feet.		
Blair's,	2328	40	0	0000		Present Portage.
Sugar Run,	2288	00	1	5120	2166	Summit.
South Branch,	2367	78	4	3280	2268	
Burgoon,	2367	78	5	4400		Too wide for a tunnel.
Kittaning,	2362	74	6	3520	2258	
Dry,	2354	66	10	2400		Too wide for a tunnel.
Harmer's,	2464	176	14	1680		do do
Elk,	2396	107	16	3520		do do

SOUTHERN ROUTE.

Embraces the surveys from Pittsburg to Chambersburg, and passes through the counties of Franklin, Bedford, Somerset, Allegheny, and Westmoreland.

From Pittsburg to the base of Laurel Hill, the preliminary surveys have been so far completed that but little remains to be done before deciding upon the best route between these two places.

From the base of Laurel Hill to Louden, the most difficult portion of the line is embraced in the passage of Laurel Hill, Allegheny Mountain, Sideling Hill, and Cove Mountain, and will require numerous and extensive surveys, before any determination can be made upon the route best adapted to the mountainous region to be traversed by the line. I would beg leave to suggest to the Board the expediency of adding to the rail road survey, an examination for a turnpike road between Louden and Laughlinstown. This survey could be conducted with less expense, if conjoined, and carried on at the same time with that for the rail road; each by a proper management being so directed as to facilitate the operations of the other.

The surveys for the Southern Route were commenced by Mr. J. A. Roebling, Principal Assistant Engineer, on the 22d of August, 1839, at Pittsburg.

Several lines were examined, leading from that city, all meeting upon the Monongahela River, below Braddock's fields.

The position of a depot, and the entrance of a rail road into a city, so rapidly increasing in population and extent as that of Pittsburg, would present considerations of so much importance, and will require so much time, and so many surveys and comparisons to determine which of the routes proposed would prove most advantageous to the city and to the rail road, that I will confine my remarks upon this subject, simply to the fact, that all the routes examined and surveyed have been found favorable.

Arriving at the point above mentioned, below Braddock's field, (about ten miles from Pittsburg,) the line was traced along the Monongahela River to the mouth of Turtle Creek, thence up the valley of the Turtle Creek to its junction with Brush Creek. Thus far the line was located with level grades upon favorable ground, but in following up the valley of Brush Creek, particularly on the middle part of it for about eight miles, the graduation of the road bed will be expensive, owing to the numerous bends in the creek, which must be cut off to preserve as direct a line as possible, and to avoid the numerous and abrupt curvatures which would necessarily occur in following the meanderings of the stream. By the Little Branch of Brush Creek the line was traced with a grade of forty-five feet per mile, to Barclay's summit, the elevation of which is five hundred and twenty-five feet above the middle stage of water in the Ohio river at Pittsburg, and descends with the same gradient, from the summit to Greensburg. Some heavy embankments and viaducts will be required to cross the branches of the Sewickly, which lies between the summit

and the town, but it is believed that by tunnelling Barclay's summit, the gradients may be reduced to forty feet per mile, and by throwing the line lower, a great reduction will be made in the heighth of the viaducts and embankments.

Much time and labor have been expended in examining the country about Greensburg, many experimental lines have been run, and it is believed no one feasible summit has been left unexplored. The maps when finished will show that nothing has been neglected to obtain the best route which the difficult features of the ground will admit.

The line, after passing through the Main Street of Greensburg at right angles, and crossing the North Branch of the Sewickly, was traced up that branch for some distance to a smaller branch, by which it was carried to Barnhard's summit.

This summit forms part of the dividing ridge, which commences at Youngstown opposite Chesnut ridge, and extends through the whole county of Westmoreland in a Northwesterly direction, running out at the Allegheny river opposite Freeport. This ridge divides the waters of fourteen mile run from those of the Sewickly and Crabtree, also the waters of the Sewickly from Brush creek, and further on the Beaver dam creek, from Turtle creek and Poketos. A thorough knowledge of this ridge is of the greatest importance, in deciding upon the line from Greensburg, and an examination will next season be made of the Southern slope, which may result in a more favorable route from Greensburg, to the break in Chesnut ridge.

Another line was traced up the main branch of Brush creek, which heads in the dividing ridge above mentioned, thence following that ridge, and passing south of Hannahstown, the line reaches Barnhard's summit with grades, not exceeding thirty-four feet per mile. This route is a few stations longer than that by Greensburg, but the least expensive, and possessing more favorable gradients. By tunnelling Barclay's summit, however, the approach to Greensburg will be rendered easier, and, as has been before stated, the gradients will be reduced to forty feet per mile.

From Barnhard's summit, the line continues with easy grades along the northern slope of the dividing ridge above mentioned, heading the branches of the Sewickly, until it reaches the summit of Fourteen mile run; from this elevated point known as Merikle's summit, the line passes almost in a straight line to the gap in Chesnut ridge, with a descending grade of forty-five feet per mile, until it reaches the flats of the Loyalhanna North of Youngstown; by tunnelling Merikle's summit, this line can be greatly improved, and the gradients are reduced to forty feet per mile.

Crossing the Loyalhanna and ascending its valley, the line passes through Chesnut ridge. Thence to Ligonier and Laughlinstown with light grades, and over ground particularly adapted to the economical construction of the road bed. The whole distance, by the line surveyed from Pittsburg to Laughlinstown, is fifty-three miles,

and the elevation at Laughlinstown (the base of the Laurel Hill,) was found to be 549 feet above the Ohio river at Pittsburg.

From Pittsburg to this point, more than one hundred miles were subjected to the test of instrumental examinations, whilst the reconnoisances embraced every point where there was a possibility of discovering more favorable routes than those which were examined.

Arrived at Laurel Hill, and but little time being left for our examinations, as the season was drawing to its close, the party was divided, and several lines surveyed from the base to the summit of the hill, which was found to be 1400 feet above the base in a distance of four miles, by a line run along the turnpike road.

As has already been stated in a previous section of this report, these surveys (although extending over more than forty miles of grade and crest lines,) did not afford sufficient data upon which to locate the route from the base to the summit of Laurel Hill. Much time was saved and our examinations facilitated, by the information and aid afforded us by Mr. W. H. Baldridge and Mr. Benjamin Parke, of Ligonier, whose extensive knowledge of Laurel Hill proved of the greatest service to the proper direction of the surveys, in this wild and almost inaccessible region.

The following statement exhibits the different summits crossed by the lines surveyed on the southern route from Pittsburg to the summit of Laurel Hill, during the past season.

Remark. The base line is level with the middle state of the water in the Ohio river at Pittsburg, and eighty feet below the offset of the basement wall of the new court house at Pittsburg.

	Elevation above base
Bench on Barclay's summit, dividing the head of Little Brush creek from the Sewickly,	525 00 Feet.
Gangover's summit, dividing the head of the main branch of Brush creek from Crabtree,	571 48
Summit S. E. of Gangover's, dividing Crabtree and Sewickly,	511 36
Summit S. W. of Gangover's, dividing Brush creek and Sewickly,	563 51
Summit north of Barclay's, dividing one of the heads of the middle branch of Brush creek from the Sewickly,	577 96
Second summit, north of Barclay's,	567 72
Slucy's summit, dividing the middle branch of Brush creek from the Sewickly,	515 83
Clopper's western summit, dividing the middle branch of Brush creek from the Sewickly,	512 00
Clopper's eastern summit,	518 90
Summit at Hannastown, dividing Crabtree and Sewickly,	437 00

Remark.—This is the lowest summit, of which the level has been taken, on the dividing ridge which extends through the county of Westmoreland.

	Elevation above base.
Barnhards' summit dividing Crabtree and Sewickly,	469 00
Merikles' summit,	572 93
Base of Laurel Hill at Laughlinstowns,	549 00
Summit of rail road line on Laurel Hill, forming the most southern branch of the Westmoreland Furnace Run,	2,000 00
Summit north of the last mentioned, and of the same branch, [From report of Mr. Hage,]	1,987 00
Summit of turnpike line surveyed north of the present turnpike,	1,906 00
First summit, north of the last mentioned, forming one of the heads of the Washington Furnace Run,	1,930 00
Second summit,	1,950 51
Third summit,	1,947 86
Suimmit of present turnpike,	1,970 00
First summit, south of the turnpike, forming one of the heads of Sugar Camp Hollow,	2,064 30
Second summit, north branch of Westmoreland Furnace Run,	1,983 59
Third summit, north of the last mentioned,	2,007 10

Highly sensible of the vast importance of the work entrusted to my charge, and deeply impressed with the responsibility necessarily connected with the discharge of my duties as the Engineer on whom will devolve the recommendation of the route which will prove most feasible, and at the same time most beneficial to the state: I commenced my examinations with the determination of leaving no route unexplored between Harrisburg and Pittsburg, which should present features favorable to the passage of this important branch of the internal improvements of the state. Many routes will undoubtedly be suggested and discovered during the progress of the surveys of next season, which have not been specifically mentioned in this report, and I would most respectfully recommend to the Board that all be instrumentally examined, which upon reconnoissance appear sufficiently feasible to warrant such examinations. The great importance of this rail raid, not only to the state of Pennsylvania, but to the United States at large, calls for the most careful examination and accurate knowledge of the country over which it is to pass, before determining on the location of a route upon which so many interests depend, and where a few miles of bad location would impose a tax forever upon the whole travelling community, and on every ton of goods which may pass over the line of rail road between Harrisburg and Pittsburg.

All of which, is most respectfully submitted by, gentlemen,

Your odedient servant,

CHARLES L. SCHLATTER, *C. E.*

Engineer's Office, Harrisburg, Dec. 27th 1839.

[No. 33.]

Report of Wm. B. Foster, Jr., Engineer, on the survey of the Lackawanna Valley.

To the Board of Canal Commissioners of Pennsylvania:

GENTLEMEN: The performance of the service required by a resolution of the General Assembly, approved the 13th day of March, 1839, authorizing a survey of the Lackawanna river and valley, from the feeder dam of the Wyoming line to the Ragged Islands, for the purpose of determining the best mode of improving the same, so as to bring the mineral and other products of said valley to market—having, by resolution of the Board dated on the 14th of August last, been confided to the undersigned, I have now the honor to report, that I have been aided in that duty by E. W. Morgan, Esq., one of my Principal Assistants, whose report, embodying much valuable information of this interesting section of our country, is herewith respectfully submitted.

From the report of Mr. Morgan, it will be seen that the products of the valley needing a market, are now chiefly, and must be permanently, mineral. For the transportation of these, the superiority of water over railway transportation, is considered a settled result of experience. The North Branch canal, now completed to the Lackawanna river, and in progress to the state line, is the only outlet to market, by state improvement, with which any line of communication through the valley can connect. The extraordinary facilities for mining and loading from the mouth of the coal beds, afforded by the hills along which a canal must pass, or which would be reached by slips from the pools from which boats might pass to the main line without transhipment, furnishes an additional argument for a water communication, if practicable.

The length of the river, from the feeder dam to the termination of the survey, at the turnpike bridge, about one and one eighth mile below Carbondale, is twenty-six miles and forty-five chains. The difference of level between the mitre-sill of the guard lock and the surface of the water at the termination of the survey, is four hundred and fifty-two and fifty-nine hundredths feet, giving an average fall in the river of seventeen and four hundredths feet per mile. The average rise per mile, in the two miles above the present feeder dam, is about twenty-eight feet, while for the remaining distance to the mouth of Roaring creek, the rate is about ten and a half feet per mile, and the same for three miles and eighteen chains, to Centreville. For this part of the valley, the banks of the river are high, with frequent bluffs and occasional narrow flats, where the hills recede from the river. If the line of improvement adopted is confined to the ravine of the river, as it must be to approach the coal most advantageously, a canal

and slackwater navigation will be found the cheapest and best mode of improving the river and valley for the object in view—to bring the mineral and other products to market. Between the pool at the mouth of Roaring creek and the village of Centreville, a distance of two miles and sixty-eight chains, the question as to the best mode of improvement, is between the excess of cost of a canal over that of a rail way of single track, and the advantages of a water communication into what may be considered the heart of the richest part of the coal field of this valley. This region will be reached by a canal and slackwater to Roaring creek. For the part surveyed above Centreville, thirteen and a half miles, the average rise per mile by the river is twenty-one and eighty-two hundredths feet. Along half of this part of the line, the banks are low, and the flats would be overflown by the erection of dams. There are also many valuable sites for water power which would be destroyed, and the damages from these causes would be greatly disproportionate to the value of the improvement. The lockage would be very expensive, but in addition to all these objections, the inadequate supply of water for a considerable trade, may be urged as conclusive against the adoption of canal and slack water. An estimate for a rail way has accordingly been made for this portion of the valley, as far as the line of the Hudson and Delaware Company, which, by the line of the survey, is twelve miles and seventy-two chains.

The Wyoming line is fed from the Lackawanna river, and the new feeder dam may be erected some two miles above the site of the old one, at a point presenting the first perfectly safe location after leaving the head of the present feeder. This is accordingly made the first division in the estimate; the second extends from the proposed feeder dam to Roaring creek—the third from Roaring creek to Centreville, and the fourth from Centreville to the Hudson and Delaware Canal Company's line. The estimates are made for a canal, with a prism of water twenty-eight feet wide at bottom, forty feet at surface, and four feet deep—the banks to be protected with wall where needed, and locks to be constructed of permanent masonry.

Estimated cost of canal, from the head of the present feeder to the proposed feeder dam, one mile and seventy chains:

Cost of construction, including dam, culverts, bridges, waste wiers, &c.,	$33,085 48
Lockage, (sixty feet,) including guard lock,	55,875 00
	$88,660 48
Add for contingencies, 10 per cent.,	8,896 05
Total cost of first division,	$97,856 53

This line runs along the foot of a hill of moderate acclivity for one hundred chains, over ground open and sometimes marshy, when the hill becomes more abrupt next to the river, at the rapids, called the "falls," containing fourteen chains along this high bank, the hill re-

cedes from the river and eighteen chains are open flat; the remaining portion is along hill side and near the river.

The site for the dam is an excellent one, requiring a little over two hundred feet wier, between natural rock banks of coarse sandstone.—The surface of the water at this point, at the time the levels were taken, was found to be forty-nine and sixty-four hundredths feet, above the mitre-sill of the present feeder guard lock.

Estimated cost of canal and tow path from proposed feeder dam, to the mouth of Roaring creek, six miles and six chains, including thirty chains of tow path above the dam at Roaring creek.

Cost of construction, including dams, culverts, bridges, waste wiers, &.	$74,408 66
Lockage, (55 feet) including guard locks,	65,250 00
	$139,658 66
Add for contingencies, 10 per cent.	13,965 86
Total cost of 2d division,	$153,624 52

This estimate is made for a tow path (with a bridge crossing the river) forty-eight chains; passing a rock bluff near the upper part of the pool, five chains on the river, and twenty-five feet high. Rising by two locks into a level of canal it passes along the river bank and through flats a distance of sixty chains, where it comes into the river with a dam of ten feet in height. Along this pool we pass continuous high banks, usually rocky and in some places for several chains rising forty or fifty feet almost perpendicularly. This pool is ninety six chains long, when it is necessary to lock up into a second pool, which is sixty chains, along banks varying in height and acclivity, with about fifteen chains of narrow flat, and fifteen chains of bold rock bluff, sixty to eighty feet high. From this there are even flats between the foot of the hill and the river, through which a reach of canal extends sixty-six chains, where we pass into the third pool which extends fifty-four chains, about thirty chains of it along high and bluff bank.

From this we pass by one reach of canal, seventy-two chains to the mouth of Roaring creek; the pool of the dam at this point, extending near half a mile above, and the estimate made for thirty chains of tow path.

There are no mills on this division, nor indeed any ground for damage claims to any amount.

Coarse sandstone, running into conglomerate, of good quality exists in abundance for locks. Dam abutments, &c. and hemlock and other timber for the crib work of dams, can be obtained with great facility and at a cheap rate. The bluff and high banks on this division, especially the upper part, abound in coal.

We will here examine the question of supply of water between the mouth of Roaring creek and Centreville. The observations for this purpose were made immediately above Roaring creek, on the 12th of

October last, before the fall rains; which, considering the dryness of that part of the season, are favorable to a minimum result.

The quantity of water passing in a day, having been calculated by several methods, I have taken the least. Between Roaring creek and Centreville, there are no tributaries of note.

When a canal is filled, we have to provide for 1st, losses from filtration and evaporation; 2nd leakage of locks, and 3rd, expenditure of water in the passage of boats through the locks.

On the authority of Col. Abert, the first may be safely estimated at two prisms per month, and the second at twelve locks full per day. We have then;

Two prisms pr month for filtration & evaporation,	57,446 cub. ft.
Twelve locks full per diem, leakage of locks,	294,760
For the passage through locks 90 by 17 and 10 feet lift, of 240 boats per diem,	3,672 000
Total exenditure of water per diem,	4,024,206

The supply having been ascertained to be six millions and twenty-six thousand and four hundred cubic feet per day, we have over two millions of cubic feet per day for wastage at the feeder dams and extraordinary losses.

Roaring creek furnishes upwards of two and a half millions, cubic feet per diem, as an additional surplus below.

The quantity of water flowing at the head of the survey, on the 21th of October, last, was two millions six hundred and fifty-eight thousand two hundred and forty cubic feet per diem. After deducting the probable waste at the feeder dam, this amount would be altogether inadequate to an active trade.

Having found a sufficient supply of water, for a canal to Centreville, we give the comparative cost of a canal and rail-way.

Estimated cost of canal and towing path from Roaring Brook to Centreville, 2 miles and 68 chains:

Cost of construction, including dams, culverts, bridges, &c. &c.	$26,222 02
Lockage [25 feet] including guard lock,	21,800 00
	$48,020 02
Add 10 per cent for contingencies,	4,802 00
Total estimated cost,	$52,822 02

About sixty chains of this division, are along banks, rising sometimes to sixty or seventy feet with bold rock bluff along the river which it is proposed to pass by Tow-path; placing the dam about half a mile above the mouth of Roaring creek and dispensing with the dam and guard lock at that place. The remaining portion of this division is through bottom lands, along the base of gently sloping hills.

The estimated cost of a Railway from the mouth of Roaring creek to Centreville, two miles and sixty-eight chains, is as follows:

For grading, and including culverts, &c.	$19,679 49
Wood superstructure, with plate rails,	11,413 78
	$31,093 27
Add 10 per cent. for contingencies,	3,109 33
Total estimated cost,	$34,202 60

The route of the Railway, would be nearly the same as that pursued by the canal. The coal beds already opened along the bluffs and the hills which limit the flats, are frequent, and admirably situated for profitable mining.

The calculations for the track, are made for a superstructure of wood, composed of sills 12 by 12 inches and eight feet long; rails 5 by 9 inches; spikes $\frac{3}{8}$ by $\frac{5}{8}$ inch and five inches long, one to every eighteen inches in length of the rail; plate rails $2\frac{1}{2}$ by $\frac{3}{4}$ inch, with suitable connecting plates.

Estimate of the cost of Railway from Centreville to the Hudson and Delaware canal company's line, about one and-a-half miles below Carbondale, twelve miles and seventy-two chains:

Grading, and including culverts, bridges, &c. &c.	$54,294 50
Wood superstructure, with plate rail,	51,762 64
	$106,057 14
Add, for contingencies, 10 per cent.,	10,605 71
Total estimated cost,	$116,762 85

About five miles and a half of this division lies through an open country, and generally along the hills, rising from the bottoms near the river.

Two miles of the upper portion, crossing from the west to the east side of the river, has the same advantages for construction, while the intermediate part is chiefly through dense hemlock and laurel, with portions of heavy excavation along the bluffs.

Chesnut and white oak timber can be obtained for sills and rails in the greatest abundance, and at a very cheap rate.

As the line of railway is nearly in the direct line of the valley with a single necessary deflection, by the river, to avoid a ridge, the curves are slight.

The grades adopted to suit the profiles are, in stations of six chains each, viz: eight stations level; ten stations three feet per mile; twenty-seven stations twelve feet per mile; ten stations thirteen and a half feet per mile; seven stations sixteen feet per mile; thirteen stations twenty feet per mile; three stations twenty-four feet per mile; one hundred and sixteen staions twenty-five feet per mile; and sixteen stations twenty-six feet per mile.

Calculating for a descending trade, the grades are admirably suited to a heavy business with a small amount of power; for from the data furnished by Mr. Wood, based on experiments of himself and the Chev. De Pambour, a grade of $27\frac{3}{10}$ feet to the mile, on a road of this construction, the component of gravity, in the direction of the plane of the road, and the resistance would be equal to each other.

A locomotive weighing ten tons, will take over one hundred tons up such a grade, so that a road with these grades will suit either direction, while the advantages are greatly in favor of the direction of the heavy trade.

The total estimated cost is, for canal and slack water to Centreville, and railway thence to head of Ragged Islands, $420,965 00

For canal to Roaring Creek, and railway thence to head of Ragged Islands, $402,346 50

I would further remark, that all of the foregoing estimates have been made as accurately as could be done without a location, and prices affixed, sufficiently liberal to cover the cost. I have guarded particularly against making an estimate with a view of inducing legislation upon the subject.

In conclusion, I may not withhold an expression of indebtedness to my principal assistant, E. W. Morgan, Esq., to whom the immediate charge of the survey was confided. It is but justice to say that the zeal and ability with which the duty was performed entitle him to the highest commendation.

All of which is respectfully submitted.

WM. B. FOSTER, Jr., *Civil Engineer.*

Engineer's Office,
Towanda, Dec. 17, 1839.

Towanda, December 14, 1839.

WILLIAM B. FOSTER, ESQ., *Principal Engineer.*

Sir:—In obedience to your instructions, I proceeded early in October, "to survey the Lackawanna river and valley, from the feeder dam of the Wyoming division of the Pennsylvania canal to the Ragged Islands, for the purpose of determining the best mode of improving the same, so as to bring the mineral and other products of said valley to market."

The smallness of the appropriation for this object limited my operations to a line within the compass and level over the most eligible ground which could be selected, by a reconnoissance between the points designated, taking notes for the topography; a compass line along the river, with a particular examination of the bed and channel and the guage of water at suitable intervals, and a reconnoisance of the mineral resources of the valley.

The last of the chain of small islands designated as "Ragged Island," as we ascend, is a short distance, below the turnpike bridge about a mile and one eighth below the village of Carbondale. These islands are scattered along for some two miles below. The length of the river, from the feeder dam to the termination of the survey, is twenty six miles and forty-five chains. The line of levels, from the guard lock, to the same point, is twenty three miles and seventeen chains, or adding seventy eight chains to avoid a ridge about five miles below the termination of the survey, twenty four miles and fifteen chains. The difference of level between the mitre sill of guard lock and the surface of water, on the 23d of October, below mill-dam at turnpike bridge, is 452 59 feet,
Surface of water above mill dam, 457 09

Here are two Benches—a Hemlock on right bank of river a little above bridge at 460, 18 feet and a Bench on left bank, just below, at 460 72 feet. The levels were taken by my assistant E. M. Hale, and from personal observation, and comparing his notes with my own, I can speak confidently of the care in the adjustment of the instrument and the accuracy of the field books.

The Lackawanna valley extends, in the prolongation of the valley of Wyoming, a little to the North of North East, limited on the South East by the Moosic mountain, and on the North West, by the Lackawanna range, embracing as they do a width of from four to five miles at the mouth of the river, gradually diminishing to about a mile and a half at the Ragged Islands. The lower part of the valley is hilly and broken. Becoming more uniform as we ascend, we find in the middle region, bottom lands of considerable extent, and hills of more gentle slopes; and with the exception of an uncleared ridge in the upper portion, this is the general character of the remainder of the survey. The principal timber is chesnut, white oak, white pine, hemlock, hickory and black walnut. The soil is fertile and easily susceptable of a culture, by which it would compare favorably with the best river lands.

In the coal basin of the Lackawanna, the strata are of three principal classes; coarse sandstone, running into puddingstone or conglomerate; argillaceous slate, and anthracite coal. The slate usually occurs a second time underlaying the coal, and the series being repeated with considerable regularity in this order, two layers of slate are found to one of sandstone and one of coal.

It appears by an examination of the ravines, in the bounding ranges of the valley, that these strata dip at a great inclination, on both sides towards the valley, while the out croppings of the coal are found on the acclivities of the monntains, The rocks beyond are of a distinct character, not belonging to the coal formation; so that the coal basin appears to be limited by the mountains which enclose the valley. The dip of the beds on the Eastern side is generally towards the river, while on the other side, it is to the North West, and sometimes to the South West, for a considerable distance from the river, where it is reversed, rising with the acclivity of the Western mountain; indica-

ting that the channel of the river is not at the lowest point of the curve of stratification. The coal is found accordingly to lie deepest in the western part of the valley, from the mouth of the river nearly to Legget's gap.

That part of the coal formation within the notice of this survey will be treated in three divisions; the first, extending from the mouth of the river to a transversal ledge above Kiser's creek, about seven and a half miles; the second, from this point up the river to a ridge which crosses the valley somewhat obliquely, embracing a length of about eleven and a half miles; and last, the remaining six miles to Carbondale.

The lower part of the valley is generally undulating, having a minor valley along the Lackawanna mountain, drained by St. John's creek, and a deep ravine with occasional narrow flats along the river; the intermediate undulations rising often into considerable hills. Between the gap at Dial mountain, through which the Susquehanna breaks into Wyoming valley, where it receives the Lackawanna, and Cobb's and Legget's gaps, nearly opposite each other in the bounding ranges, some eleven miles up the Lackawannn, the intervening portion of the valley seems to have partaken of the great convulsions in which they had their origin. The stratification in our first division maintains its usual relations, but often contorted and varying to every degree of induration. There are nevertheless several beds of coal opened, and some of them very easily mined. Still, the openings are not sufficiently frequent for a thorough examination; though it may be remarked of this, as of a great part of the valley, that the coal seams are commonly struck in boring for water, and sometimes in excavating cellars.

In the second division, comprising the middle portion of the survey, the openings are frequent, most farmers getting their home supply of coal from their own grounds. The ravines in all parts have made natural sections in the coal strata, sometimes open to the view, and at all times easily exposed by stripping off the covering formed by the action of weather in the crumbling of superincumbent slate and sandstone. This remark admits of general application to the valley. The beds of the creeks and river are often of solid coal. This whole field, accessible in the banks which limit the bottoms along the river, and intersected by ravines, diverging on each side with the confluents of the stream, offers singular facilities for mining and exportation, whenever a channel of communication shall be formed through the heart of the valley to connect with an outlet of trade. I have been able to trace satisfactorily six distinct strata of coal in this part of the valley, above the surface of the river, of thickness as follows, beginning at the bottom: 1st, 4 feet; 2d, 16 feet; 3d, 5 feet; 4th, 3½ feet; 5th, 6 feet; 6th, 5 feet;—in all nearly forty feet. Reduction has been made in the thickness to allow for the thin layers of slate found in the coal, from which, however, many coal beds of the Lackawanna are remarkably free. It may be proper to say, as to the depth of the coal formation, that in Legget's creek, in the gap of the same name, a coal

stratum is laid bare, dipping towards the valley, at an angle of about 25 degrees; while some 250 feet above this, another stratum shows, of a little greater inclination, and the out cropping of probably the upper seam is found at an elevation of about 400 feet above the bottom of the ravine. But the depth of this formation can be only a question of curiosity for centuries. Since the amount of coal, not requiring drainage in mining, is beyond the possibility of exhaustion within a period, far beyond the contemplation of this generation. It is not to be inferred, that all the strata before mentioned, can be found in every place. By the action of floods and other causes, portions of the upper seams have been removed, while the parts left are to be found in the remaining elevations, cropping out on the hill sides, or intersected by ravines; yet it hardly admits of a doubt, that coal underlays this whole region; and that it may be worked advantageously in nearly all parts, except the river flats. The coal of the whole valley is generally well roofed, though an exception in this particular is found in a considerable tract, on the east side of the river, commencing some two miles above Roaring creek, and extending three or four miles up the valley. The overlaying slate and sandstone have decayed by exposure and are in some places removed, by which the coal is laid bare to the weather and crumbled into a black dust. It is, however, to be remembered that this is the upper statum, and that good roofs may yet be found for the seams below. The strata of the middle portion, lying generally with no more inclination than is favorable to mining and drainage, are undisturbed, except in the vicinity of the gaps in the mountains, appear to form the most uniform, abundant and accessible coal region of the valley.

The remaining division is separated from that last considered, by a ridge of perhaps one hundred and fifty feet elevation, crossing the valley obliquely, from east to west. In this ridge and about it, no coal has yet been observed; and the position and character of the rocks have induced the suspicion of an anticlinal axis along which the coal and attending strata have been removed; but this necessarily remains to be determined by future observation. Certain it is, that no coal is opened until we come to the valuable coal tract of Thomas Meredith, Esq., two miles below Carbondale. The extensive beds about Carbondale, and the similarity of the valley below until we reach the ridge, render it probable that there is little of this portion where coal cannot be found when the wants of the market shall call for its developement.

It may be remarked generally, that the coal strata are exposed far up the ravines of Legget's, Roaring, Grassy Island and White Oak Creeks.

To form some idea of the quantity of coal in the region surveyed, it may be premised, that it embraces more than forty thousand acres. From what has been said it may be considered that nearly the whole valley is underlaid by coal; but on the bottoms there is some that is accessible by drifts, and in the more elevated portions a deduction must be made for strata inaccessible, or greatly inclined. Wishing

to obtain a minimum limit, say then there are twenty thousand acres of workable coal. We have found in the elevations about forty feet of coal. Making due allowance for portions of strata wanting in the lower regions, we will assume fifteen feet for the whole coal field; but for a minimum calculation, take this thickness for the half area and deduct twenty per cent. for supports and waste in mining and we have twelve feet. The minimum specific gravity of anthracite may be taken at 1.4, which gives in round numbers seventeen hundred tons per acre of coal for each foot in thickness. From these data we have over four hundred millions of tons—a quantity within a safe estimate; yet sufficient for an export of a quarter of a million tons per year for forty generations.

In illustration of the preceding estimate, we may refer to the Hudson and Delaware canal company's works at Carbondale. These have been in operation eleven years in a single stratum, and an area of about seventy acres has been excavated. During the past year about one hundred and twenty thousand tons have been carried out. The reports of their operations for eight years (not consecutive) amount to seven hundred and seventy-three thousand tons, and their whole exports, it is presumed, must have exceeded a million of tons; to which is to be added, for the whole proceeds of the mines, the consumption by a considerable town and colliery.

Aside from these works, the coal exported from the valley is small in amount, being some three thousand tons annually, carried by waggons or sledges to the state of New York, and exchanged for salt, gypsum, &c.

The quality of the Lackawanna coal is so well known in market, as to render it unnecessary to say more than that it is deemed not inferior to any anthracite of our country.

I observed in the valley, particularly in the middle portions, very considerable quantities of the clay-iron stone, occuring in kidney shaped masses and nodules, from an inch to two feet in diameter, and when in place, deposited in a layer or stratum, uniform and regular, with the interstices filled with indurated clay; and sometimes overlaying the whole a thin seam of impure anthracite. It is represented also as occuring stratified. Bog ore is likewise found in the depressions between the more elevated portions of the valley. The progressive deposite, and sometimes induration, of carbonate of iron from chalybeate water, is observed in all parts of the valley; the outside being supplied by the decomposition of pyrites in the coal strata. Two forges were formerly in operation here, for which this metal from bog ore was used. Of the quality of these ores for smelting, I have no means of judging accurately. I content myself with giving Professor's Silliman's opinion, after an examination of this valley. Journal of Science and Arts, Vol. 18, No. 2, 1830.

"The large quantities of argillaceous or clay iron ore, which are connected with the coal strata, and the bog ores, which appear also to abound here, are well worthy the attention of the inhabitants—and it can scarcely be doubted, that the difficulties hitherto experien-

ced in the use of anthracite in the smelting of iron will be overcome, and then all the means of manufacturing iron will be here at hand." [Lime is entirely wanting in the valley.] It is worthy of remark, that the consummation of the distinguished Professor's prophecy is well nigh attained, in the successful operation of the anthracite furnaces at Mauch Chunk and Pottsville.

Some six miles of the upper portion of the survey, is yet an almost unbroken forest of hemlock and pine timber. There are here seven saw mills, some of them double set—and below this, where there is yet much timber remaining, there are four more. From the best information in my possession, these mills cut annually from five to six million feet of lumber, chiefly pine, and they are increasing their capacities. Of this account, four millions are estimated as going to New York, by the Hudson and Delaware Canal Company's line.—With the increasing manufacture of lumber, the pine of the valley must be exhausted in about ten years.

It appears from the foregoing, that coal must be considered as the ultimate staple of the valley, capable of developement to any devised extent.

Rail ways have been projected by companies, and seconded by legislation, from the valley to the Delaware, by Cobb's Gap—to the state line by Legget's Gap, and to the state line from the upper part of the valley.

The profiles, calculations and estimates for the improvement of the valley, made under your supervision, are herewith respectfully submitted. The topographical map of the survey, with the coal beds now opened, will be submitted as soon as it can be completed.

I have the honor to be, Sir,

Very respectfully,

Your ob't serv't,

E. W. MORGAN,

Principal Assistant Engineer.

ANNUAL REPORT

OF THE

BOARD

OF

CANAL COMMISSIONERS,

FOR THE YEAR ENDING

31st OCTOBER, 1840.

Read in Senate, Jan. 15, 1841.

HARRISBURG:
ELLIOTT & M'CURDY, PRINTERS

1841.

EXECUTIVE DEPARTMENT,
Harrisburg, January 15th, 1841.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania:

GENTLEMEN:—I have received from the Board of Canal Commissioners, their annual report, giving a view of the works of internal improvement, and the various transactions connected with that subject, for the year ending the 31st day of October, A. D. 1840, with accompanying documents, which I have directed to be transmitted to the General Assembly.

DAVID R. PORTER.

CANAL COMMISSIONERS' ROOM,
Harrisburg, January 1st, 1841.

His Excellency

DAVID R. PORTER,

Governor of Pennsylvania:

SIR:—By order of the Board of Canal Commissioners, I have the honor of transmitting to you their annual report, for the year ending the 31st of October, 1840, and the accompanying documents.

EDW. B. HUBLEY,
President.

REPORT.

The Canal Commissioners respectfully submit the following report:

Since the date of their last report the Board have used every exertion which the means placed at their command would justify, to put and keep in good order for navigable use the finished lines of the improvements of Pennsylvania. Those exertions have not been without their beneficial results during the year, as was fully evidenced in the almost uninterrupted transportation at all those points where *ordinary* repair, or the power vested in the Board and its officers, could overcome existing difficulties. With the exception of one breach the navigation from Philadelphia to Pittsburg has scarcely been suspended a single day since it was opened in the spring, from any cause other than a deficiency of water in the streams which supply the upper levels of the Juniata and Western Divisions. The repairs thus made have caused a large drain upon the Treasury. Such an expenditure was, however, expected by those who had made themselves fully acquainted with the condition of the several lines in the spring of 1839. The natural decay of the perishable materials on seven hundred and twenty-six miles of canal and railroad had then taken place, and the original defects in the erection of many of the structures had become so manifest by their bad condition as to require immediate renewal. The alternative was thus presented of abandoning a considerable portion of the lines, or of putting them in a state of thorough repair, to answer the great purposes for which they were originally intended. With a view of exhibiting the actual condition of these works the Board, on the 11th of March, 1839, laid before the Legislature the reports of the Engineers who had been selected with an especial reference to their competency to make the necessary examination, in which the actual cost of repairing all the finished lines of improvement, including the renewal of the north track of the Columbia railroad, was estimated at about one million and a-half of dollars. The experience of the two last sea-

sons has clearly demonstrated that this estimate fell below rather than exceeded the actual amount required. When, however, the repairs contemplated in the estimates of the Engineers accompanying this report shall have been perfected, the annual appropriation to this branch of the public service will not, for some time to come, be required to exceed the amount actually necessary for ordinary purposes. The appropriation for repairs made at the last session has been for some time exhausted, and there remained due on the 1st of November, 1840, the following sums for ordinary and extraordinary repairs, viz:

Delaware Division,	$30,855 57
Columbia Railroad,	47,680 63
Eastern Division,	9,949 78
Juniata Division,	14,509 35
Portage Railroad, (no return,)	
Western Division,	27,964 56
Beaver Division,	35,700 00
West Branch Division,	20,659 00
North Branch,	79,809 11
Susquehanna Division,	875 00
Total,	$268,003 00

The cost of repairs has heretofore considerably increased in consequence of the late period of the session at which the appropriations have generally been made. The season for making repairs has passed away before the bill providing the funds has become a law, and they have to be postponed until another year. The expenditure for these purposes is much enlarged by this cause of delay, for true economy dictates that when repair to works of this character is needed, the sooner it is accomplished the better. Besides, the want of funds at the proper season and the uncertainty as to the period at which they can be obtained, prevent the Supervisors from procuring materials unless at prices much beyond their current cash value.

These sources of increase in the expenditures can only be arrested by the early action of the Legislature, on the bill making appropriations for the public improvements.

In their last annual report, the Board stated the number of miles of canal and railroad belonging to the Commonwealth, completed and in operation to be 726¼. Forty-two miles of additional canal have been brought into use by the opening of that portion of the Shenango line of the Erie Extension, commencing at the head of the Beaver Division, and ending at the town of Greenville. The table of the number of miles of finished railroad and canal will, with this addition, stand as follows:

	MILES.
Delaware Division, from Bristol to Easton,	59¾
Columbia Railroad, extending from Broad and Vine streets in Philadelphia, to the Basin in Columbia,	82
Eastern Division, extending from Columbia to the junction of the Juniata and the Susquehanna Divisions, on Duncan's Island,	44½
Juniata Division, extending from the junction at Duncan's Island to the Basin at Hollidaysburg,	127½
Portage Railroad, extending from Hollidaysburg to Johnstown,*	36
Western Division, extending from Johnstown to the Monongahela river, at Pittsburg,	104¼
Beaver Division, extending from the Ohio river, at the mouth of Beaver, to the head of slack water on the Shenango, six miles above Newcastle,	30¾
Erie Extension, extending from the head of the Beaver Division to the town of Greenville,	42
French Creek Feeder, extending from the head of navigation in the pool of Bemmis' dam, three miles above Meadville, to the junction of the Erie Extension, including the Conneaut Lake,	27
Franklin Line, extending from the Feeder Aqueduct, seven miles below Meadville, to the town of Franklin, on the Allegheny river,	22¼
Susquehanna Division, extending from the junction at Duncan's Island, to Northumberland,	39
West Branch Division, extending from Northumberland to Farrandsville,	73
North Branch Division, extending from Northumberland to Lackawana,	72¼
Lewisburg Side-Cut, extending from Lewisburg to the West Branch Division,	⅝
Bald Eagle Side-Cut, extending from the pool of the Dunnstown Dam, on the West Branch Division, to Bald Eagle Creek,	3⅝
Lackawana Feeder, at the termination of the North Branch Division,	¼
Allegheny Branch of the Western Division, in Alleghenytown,	¾
Feeder at Johnstown, on the Western Division,	1½
Feeder at the mouth of the Raystown Branch of the Juniata Division,	1
Number of miles canal and railroad completed,	768¼

*Add 264 perches running parallel with the basin.

The receipts for tolls collected on the several lines of the public improvements, for the year ending the 31st October 1840, is as follows:	
Canal,	$520,038 91
Railroad,	292,045 45
Motive Power,	296,354 36
	$1,108,438 72
Deduct drawback on flour,	22,585 00
Actual amount collected,	$1,085,853 72
The collections from the same sources for the year ending the 31st October, 1839, amounted to	$1,142,633 04
Showing a decrease of tolls in 1840, as compared with 1839, of	56,779 32

The cause of this decrease is undoubtedly to be found in the embarrassed condition of the monetary affairs of the country. The same operations which control the laws of trade in our foreign commercial transactions, have been exhibited in our domestic commerce. During the last year, the large debt due from this country to the citizens of foreign nations, has caused a diminution in the imports, whilst the exports of articles of domestic production have been greatly increased. This excess has been applied to the liquidation of that debt. The value of the imports for the year ending the 31st of October, 1840, as compared with those of the previous year, exhibits a decrease of $57,286,241, whilst the value of the exports shows an excess over that of 1839, of $10,500,000, and exceeds the imports of 1840, by $26,766,059. Of the exports of 1840, the value of articles of domestic production amounted to $115,762,617, and that of foreign production to only $17,809,333, being an increase in the exportation of domestic articles of $6,845,937 over any previous year. The result of this operation of our commercial relations with foreign countries, has necessarily diminished the revenue of the General Government for the last fiscal year. A similar effect has been produced by similar causes, upon the revenue which the State derives from the public works. The debts due by the western and south-western to those of the Atlantic States, had to be paid principally by the production of the first named states, and besides required a stricter economy in their purchases for home supply. We accordingly find, that during the past year, the shipments from the west upon our improvements, of those articles which comprise a considerable portion of our foreign exportations, and which pay a low rate of toll, have been considerably augmented ; whilst the shipments from the east, of articles of foreign growth or manufacture, entering into the general consumption of the country, and paying a higher rate of toll, have been greatly reduced. An examination of the accompanying tonnage statements, compared with those for 1839, exhibit an increase in the shipments of flour, cotton and tobacco, eastwardly, from Pitts-

burg, and a decrease in groceries, merchandize, &c., shipped westwardly from Philadelphia. It will likewise be seen by the following statement of the increase or decrease in the amount of tolls collected at the several offices during the year ending the 31st of October, 1840, compared with those of the preceding year, that the tolls received at the offices at the western termination of the line, and at those established for the accommodation of the local trade, have been increased; whilst at the offices at the eastern end of the line, as well as at those at the several places of transhipment between the east and the west they have fallen off, and that in fact it is at these points where nearly the whole of the decrease has taken place.

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STATEMENT,

Showing the increase or decrease in the amount of tolls collected at the several offices for the year ending 31st October, 1840, as compared with the collections of 1839:

	Increase.	Decrease.
Easton,	$ 1,933 62	
Bristol,		$ 1,893 29
New Hope,	2,334 49	
Columbia,		26,689 59
Portsmouth,		15,312 06
Harrisburg,		5,614 56
Newport,	1,017 79	
Lewistown,	3,419 75	
Huntingdon,	971 43	
Hollidaysburg,		29,463 40
Johnstown,		18,861 63
Blairsville,	761 17	
Leechburg,	1,131 37	
Alleghenytown,	2,452 66	
Beaver,	844 41	
Franklin,		406 48
Liverpool,	1,321 12	
Northumberland,	2,298 32	
Williamsport,	1,756 17	
Dunnstown,	4,972 66	
Wilkes-Barre,		560 21
Berwick,	479 77	
Columbia outlet locks,	4,596 89	
Portsmouth do.	282 59	
Portsmouth Bridge,		149 61
Acqueduct at Duncan's Island,		
" " Kiskeminetas,		32 07
" " Pittsburg,		578 30

(STATEMENT CONTINUED.)

	Increase.	Decrease
Junction,	$884 94	
Philadelphia,		$4,632 32
Paoli,		785 86
Parkesburg,	19,534 61	
Downingtown,		4,514 32
Lancaster,	24,817 00	
Schuylkill Viaduct,	504 21	

In revising the rates of toll for 1840, the Board, after mature deliberation and consultation with individuals whose avocations and opportunities of obtaining practical information inspired confidence in their opinions, came to the conclusion that the interest of the Commonwealth demanded a reduction on those articles which, from the then rate of toll, were seeking other channels of transportation.—The tolls on groceries, iron and several articles of merchandize, were accordingly reduced; and a drawback of twenty cents allowed on each barrel of flour shipped from Pittsburg and carried the whole distance on the improvements of the Commonwealth to Philadelphia. This reduction, so far from being the cause of the falling off in the aggregate amount of tolls, has had the contrary effect. Before the revision, flour was shipped to eastern markets even from Pittsburg by the way of the Ohio and Mississippi; and in like manner many articles of merchandise intended for the west and south-west, which were usually transported on the improvements of Pennsylvania, were shipped coastwise by the way of New Orleans, and from thence taken up the river to their places of destination. From the facts which have come to the knowledge of the Board, there is every reason to believe that the operation of the reduced rates of tolls in a great measure reversed this state of things, and brought back to our improvements the trade, which, from their advantageous location legitimately belongs to them. Immediately after the allowance of a drawback took effect, not only did the shipment of flour from Pittsburg down the Ohio cease, but a large quantity was brought up from a considerable distance below that city, and found its way to an eastern market by our public works. That the revenue has been increased by the establishment of this drawback is clearly demonstrated by a comparison of the number of barrels of flour shipped from Pittsburg in the corresponding periods of 1839 and 1840. The drawback went into effect in March last: that month is therefore taken as the commencement of the periods of comparison. The tonnage statement exhibits the following results:

	No. of barrels shipped from Pittsburg in 1839.	No. of barrels shipped in 1840.
March,	5,723	9,019
April,	28,511	36,156
May,	10,092	21,966
June,	4,030	28,277
July,	998	7,672
August,	873	7,878
September,	1,895	11,596
October,	3,107	13,688
	55,229	136,252
Shipped in 1839,		55,229
Increase of 1840 over 1839,		81,023

Of the one hundred and thirty-six thousand two hundred and fifty-two barrels shipped as above in 1840, one hundred and twelve thousand eight hundred and twenty-five were entitled to the benefit of the drawback. The amount of drawback on that number of barrels is twenty-two thousand five hundred and sixty-five dollars, which at the rates of 1839, would be equal to a loss of tolls on thirty thousand and eighty-seven barrels. The increase in the shipments of 1840 over 1839 is, however, eighty-one thousand and twenty-three.

	81,023
Deduct loss by drawback,	30,087
Leaving a clear gain of (blls.)	50,936

which, at the present rates, has produced an increase of thirty thousand seven hundred and sixty-three dollars and nineteen cents in tolls on flour consequent upon the drawback.

It is true that the tables do not present an increase of tolls on articles shipped westward, upon which a reduction was made. This decrease is, however, to be attributed to the fact that, from the causes previously alluded to, the transportation from the east to the west was much diminished by the limited supplies purchased in the eastern markets, as compared with the previous year. Had the former rates of toll been continued, it is certain that the aggregate amount of revenue derived from that source for the year just ended, would have been reduced by the diversion of the carrying trade to other channels.

The Board have treated this subject somewhat in detail, for the purpose of showing that the deficiency in the revenue from tolls has arisen from causes over which the officers of the Government had no control, and which do not in the least degree affect the character, the

usefulness, or the prospects of our improvements. It can scarcely be necessary, at the present day, to enter into an argument to prove that the increase in the collections from this source must be progressive. The revulsion in trade which naturally follows an indulgence in a spirit of wild speculation, or an undue expansion and sudden contraction of the principal circulating medium of the country, may occasionally reduce the amount of tolls from our works below those of a previous year, but it only requires an examination of the advantages of our local position as a carrier between the eastern and western waters, and of the inexhaustible sources of trade which Pennsylvania contains within her own borders, to satisfy the most skeptical that the period is fast approaching when the revenue from our improvements will only be limited by their capacity to accommodate the transportation and travel which may be brought upon them. Portions of the main lines are at present unproductive in consequence of their extensions being still in an unfinished state. These extensions have been so far progressed with, as to admit of their entire completion in the year 1842. When we shall have formed a connection with the improvements of New York by the North Branch, when we shall have reached the waters of the Lakes by the Erie division, and have afforded an outlet to the coal of Lykens and Bear valleys, by the Wisconisco canal, we shall then find that the anticipations of the friends of the State improvements were not the result of visionary theories.

Besides the increase of trade which can confidently be relied on from the completion of the unfinished lines, and from the additional impetus which must be given to transportation by the rapid development of our mineral resources, which is now taking place along those portions of the public works which have been brought into use, the enterprize of private companies, whose improvements connect with those belonging to the Commonwealth, will undoubtedly swell the receipts from tolls by the new outlets and facilities which they give for the conveyance of our productions to market.

The Tide Water Canal, extending a distance of forty-five miles from Columbia to Havre-de-Grace, at the junction of the Susquehanna with the Chesapeake Bay, has been in successful operation during the year. The Williamsport and Elmira Railroad connecting the West Branch Division, by the way of the Chemung Canal and Seneca Lake, with the New York Grand Canal, and the New York and Erie Railroad, will, when finished, give another avenue for transportation and travel, which must ultimately benefit the revenues of the State. The Union Canal Company, too, are widening their locks from the coal region at Pinegrove, to the intersection of the main line of the Pennsylvania Canal at Middletown, which will tend to throw upon that portion of our works a large amount of tonnage, which now, from the capacity of the company's canal, is almost entirely locked up. When the improvements shall have been made to the extent contemplated by the company, this canal, besides increasing the business upon the State works by the larger amount of coal

which will be shipped from the Pine Grove region, will afford to the citizens of our commercial metropolis a continuous canal communication to the Eastern base of the Allegheny mountains for boats of the same capacity as those which now navigate the Pennsylvania Canal.

These works cannot be considered as rivals to those belonging to the Commonwealth. It may be that they will take off a portion of the transportation from our lines at their points of intersection, but that loss will be overbalanced by the additional tonnage and travel which will be thrown on to those lines in consequence of the increased facilities given to the agriculturist, the manufacturer and the miner, in disposing of the products of their labor.

As another source of revenue the Board would recommend the selling or leasing, under necessary and proper restrictions, of the water power created by the public works. At present, the Board have no authority to dispose of this surplus power, and individuals are prohibited under heavy penalties, from using it in any manner whatever. If this authority were vested in the Board, it would add much to the wealth of the Commonwealth by the multiplication of manufacturing establishments, and at the same time increase the receipts from our improvements. This, together with the suggestions in a succeeding page, under the head of the motive department of the Portage Railroad, relative to the transportation of passengers, and purchase of trucks for the conveyance of section canal boats over the Pennsylvania, railroads merit the consideration of the legislative body.

There are one hundred and sixty-five and three-quarter miles of canal now in progress of completion, divided into the following lines, viz :

	MILES.
North Branch division, from the Lackawana to Athens,	90
Erie extension, from Greenville to the harbor of Erie,	63½
Wisconisco canal, from the mouth of the Wisconisco creek to Duncan's Island,	12¼
Total unfinished lines in progress,	165¾
Canals and railroads in operation,	768¼
Total number of miles of canal and railroad in progress and completed,	934

Sixty-nine miles of canal and railroad which had been commenced have been suspended, as follows :

	MILES.
Sinnemahoning extension,	33
Kittanning feeder,	14
Gettysburg railroad, (that portion upon which the grading had been commenced,)	22
Total,	69

30¾ from Ohio R. to 6 miles above Newcastle
42 to Greenville
63½ to Erie
135¼
30 to Pittsburg
165 Total Pitts'g to Erie

The whole cost of the lines now in progress, is estimated to be—

North Branch extension,	$3,553,600 86
Erie extension, (including that portion of the Shenango now in use,)	3,384,835 22
Wisconisco canal,	416,316 51
	$7,354,752 59

To complete those lines the following sums will be required, viz:

For the North Branch extension,	$1,606,934 20
Erie extension,	1,218,168 56
Wisconisco canal,	146,316 51
Total amount required to complete,	$2,971,419 27

There have been expended on the suspended lines the following sums:

Sinnemahoning extension,	$164,124 00
Kittanning feeder,	31,100 00
Gettysburg railroad,	666,666 66
Total amount expended,	$861,890 66

During the past year the work on the unfinished lines under contract, has been prosecuted with all the vigor which the amount of the appropriation would permit. The whole are now in such a state of forwardness as to be completed by the year 1842, if the Legislature should see proper to appropriate the requisite funds for that purpose. Their completion at the earliest day possible, is earnestly urged upon the Legislature as a measure of sound economy. The delay which has already taken place in their prosecution, from the inadequacy of the annual appropriations, has added considerably to the cost of their construction. The Commonwealth is now paying a large amount in interest on the sums already expended upon these lines, and until they are brought into use they must continue to be a burthen upon the Treasury. When they shall have been finished, the State may confidently rely upon an increase to her revenue. It would therefore seem to be the dictate of a wise and prudent policy that these important connections should be finished without delay.

The Board will now proceed to give a statement of the condition of the several lines of canal and railroad.

DELAWARE DIVISION.

The navigation upon this division opened on the 20th of March last, and was continued through the year without any material interruption. During the winter the walls were raised from two to four feet

at points most exposed to the action of the ice and high water, in consequence of which the last spring ice freshets, heretofore so destructive to the upper levels of this division, passed off without doing any material injury.

Five locks, the aqueduct at Knowles' Creek, and the waste-wiers at Morrisville, Neilly's Creek, and Wells' Falls have been partially repaired.

The State wharf at Bristol has undergone a thorough repair; an additional pier has been constructed, and the mud excavated from the river bottom along the whole front. These improvements will afford additional facilities to persons engaged in the transportation of coal, as vessels employed in that trade can now load at the wharf at any stage of the tide.

The capacity of this line was materially increased during the past season by cleaning out the bars which had formed in the bottom of the canal, and excavating it to its original depth. The Engineer reports that boats heretofore carrying only from forty-five to fifty tons, are now transporting from fifty-five to sixty tons without difficulty.

The new dam at Easton is nearly completed. The progress of the work was retarded by a recent freshet in the Lehigh, which overflowed one of the new abutments, and carried off about 10,000 cubic yards of earth. This dam is built in the most substantial manner, and will, when entirely finished, be able to resist the floods of the Lehigh.

The Board would refer the Legislature to the report of the Principal Engineer, William K. Huffnagle, Esq. for a detail of the transactions upon this division the present year.

The importance of keeping up an uninterrupted navigation on this line, is too apparent to require any argument. The large and constantly increasing trade from the mineral regions of the Lehigh, supplying a considerable portion of the demand for fuel in the principal markets of the Atlantic States, and entering, as the consumption of coal does, into the economy of large numbers of the community, would seem to point to an early appropriation for repairs, as the best evidence of a wise and provident policy in relation to our public works.

The following estimate shows the amount required for repairs, viz:

Repairs to locks,		$11,150 00
do	aqueducts,	1,050 00
do	waste-wiers and overfalls,	2,070 00
do	bridges,	2,000 00
do	slope and vertical walls,	3,690 00
do	dam and feeding wheels,	14,033 00
Excavation of rock from canal,		2,450 00
Work under contract, not commenced,		2,856 00
		$39,299 00

Notwithstanding the general depression of business, the tolls on this division, for the year ending the 31st of October, 1840, amounted to ninety-six thousand nine hundred and ninety-six dollars and twenty-five cents. For the same period last year, ninety-four thousand six hundred and ninety-five dollars and forty cents.

The sum drawn from the Treasury during the fiscal year just ended, for repairs is seventy-six thousand thirty-eight dollars and six cents.

In their last report, the Board recommended "that the capacity of this canal should be increased by widening the locks. They are at present ninety feet in length and but eleven in width, which will only admit the passage of boats of about sixty tons burthen, while the water-line of the canal is forty feet, and its depth is five feet, sufficient to pass boats of one hundred tons burthen, if the locks were ninety feet long and seventeen feet wide, the size of those upon the Susquehanna." The Morris Canal Company having commenced widening the locks and increasing the capacity of their canal, which, when finished, will draw off a portion of the tonnage which has heretofore been transported on the Delaware Division, unless the capacity of the locks should be increased. It is the undoubted policy of the Commonwealth, to make this improvement, whenever the state of the Treasury will warrant an appropriation for that purpose.

COLUMBIA AND PHILADELPHIA RAILWAY.

The travel upon this railway was much impeded in the early part of February last, by the sudden breaking up of the frost. A considerable portion of the road was originally laid upon blocks, without a sufficient number of cross-ties to preserve the adjustment necessary for large trains propelled by heavy locomotive engines. The consequence has been, that whenever the frost left the ground, the soil becoming saturated, afforded no support to the blocks,—the rails would necessarily spread, and the engines and their trains thereby precipitated from the track, to the serious injury of the transporter, a loss of revenue to the Commonwealth, and a most annoying interruption to the regular business of the road. To remedy this defect, an additional number of cross-ties have been inserted. The security afforded by the improvement already made in this particular, will warrant a farther appropriation for the purpose of inserting cross-ties in all the weak points of the road, and thus render the heavy transportation upon it, in the spring, at once safe and certain.

Since the breaking up of the winter, the transportation has not been interrupted and the business of the road has been conducted in a manner satisfactory to the mercantile and travelling portion of the community, and highly creditable to the officers having it in charge.—When the present officers were assigned to this railway, they found it in a bad condition, but their intelligence and industry have suggested and made such improvements as will, when fully completed, as

they may be at a comparatively small expense, not only reduce the annual expenditures for repairs, but render the road one of the best in the Union.

Several of the bridges on this line have received thorough repairs; that over the Conestoga, near Lancaster, has been *arched*, and so strengthened as to bear any weight to which it can be subjected. The bridges over the Gap, at Reeseville, and at Sener's, will require slight repairs.

The principal depots, the water stations, and woodsheds, will require but a small expenditure to keep them in repair.

The deep-cut at Parkesburg, has been a continual source of expense. The blue clay or marl, of which the soil is composed, is constantly sliding into the trenches or drains, thereby filling them up, and causing a heavy expenditure to keep them open. To remedy this, the Engineer proposes to construct a stone wall, or wharf composed of logs, tied with shores into the respective sides of the cut. Estimated cost, $3,000.

Much inconvenience has been experienced for the want of a depot for locomotives in the vicinity of Lancaster. The increasing trade which is thrown on the road from Cumberland Valley, added to that of a more local character, which is constantly accumulating at several points near that city, is of sufficient importance to justify the erection of a depot for the shelter of engines at the proposed point. For the want of such a building when the requisite number of locomotives could at all times be in readiness, the transportation of produce from what are called the way-stations, has frequently been delayed for a day or two. This cause of complaint on the part of the transporters can be obviated by the construction of the depot referred to. Estimated cost $12,650. An appropriation to that amount will be required if it shall be determined to construct the work.

The Board would again call the attention of the Legislature to the propriety of constructing a road to avoid the Schuylkill Inclined Plane. The many reasons in favor of this measure have been so frequently presented, that it is scarcely necessary to repeat them at this time. The same delay in transportation, the same annual drain upon the revenues of the Commonwealth to keep up this plane, which first suggested the necessity of avoiding it by a less objectionable route into the city, still exist in all their original force. The Board, at the last session, in obedience to a resolution of the Legislature, made this matter the subject of a special report, in which the relative advantages of the several proposed routes to avoid the plane were specifically stated. Subsequent information confirms the Board in the opinion that the route then recommended is the best, which under all the circumstances and interests which bear upon this question can be adopted. By reference to the report of the Engineer, (which will be found among the accompanying documents,) it will be seen that the course of the proposed route, after leaving Whitehall the point of deflection from the present road, "continues very direct, the cutting is light, and undulations so regular as to afford convenient

opportunities for deposite, without the necessity of making spoil bank. After passing through the lands of Llewellen and others, the line encounters the irregular formation in the vicinity of Indian creek, and crosses its north and west forks by heavy embankments. Thence the line diverges to the north-east, and passes near Hestonville, where it intersects or is made parallel with the West Philadelphia road as far Elliott's Tavern, a distance of $1\frac{1}{2}$ miles. At this point the line takes an eastern direction, and crosses the Schuylkill above the dam, intersecting the main line and present route at Pratt's garden. The length of this route is $9\frac{1}{4}$ miles, having no grade exceeding 40 feet per mile, which is reduced on the curves in proportion to their deflection."

The estimates of the Engineer show that the construction of this route would reduce, instead of adding to the annual expenditures of the Commonwealth.

If, however, in view of the state of the finances, or from a conviction that the present route should be maintained, the Legislature should determine that the plane shall not be avoided, then it will become necessary that the north track from Whitehall to the head of the plane should be re-laid, and put into complete order for use. The necessity of this is obvious. When the renewal of the north track authorized by the Legislature at its last session, from the intersection of the West Chester railroad to Whitehall shall have been completed, which will not be delayed longer than the early part of the spring, there will still remain but a single track from the last named station to the head of the plane. The inconvenience of having but one track, even for a short distance, on so great a thoroughfare between the east and the west, has been so frequently presented to the view of the Legislature, as to render any further observations unnecessary. The expense of relaying the tracks between these two points, a distance of six miles, is estimated at eighty-one thousand nine hundred and sixty dollars. To this must be added six thousand one hundred and ten dollars for relaying the north track of the plane, the condition of which is becoming such as to impair the safety, as well as the facility of transportation upon it.

The act of the last session of the Legislature, entitled "An Act to provide for continuing the improvements of the State, and for the payment of the interest on the public debt," appropriated one hundred thousand dollars towards renewing the north track of this railroad from the twenty-second mile post to White Hall, "provided that the said sum shall be taken out of the fund for repairs." As soon after the passage of the act as practicable, contracts were entered into for the delivery of the materials, with the exception of the iron rails, and the line, divided into fourteen sections, was let to responsible contractors. The work has been prosecuted with commendable vigor. The impracticability of obtaining the iron rails in this country, at any reasonable rate, suitable for the road, compelled the officers having charge of the improvement, to enter into contract with the agents of a foreign house for one-half the amount required. The balance has been taken from the track abandoned by the construction of the road to avoid the inclined plane at Columbia.

This will enable the contractors to finish about five and a-half miles of the track, which will be brought into immediate use. The balance of the line only awaits the arrival of the iron, and will be completed in time for the spring business. The sum of seventy-five thousand dollars was taken from the repair fund for the prosecution of this work, being all which, in the opinion of the Board, could be spared from that fund, under the bill of last session.

The estimated cost of relaying eleven and three-fourth miles of the track between the points specified in the act of Assembly, is	$127,130 00
Deduct amount appropriated last session,	75,000 00
Amount required to complete,	$52,130 00

For a detailed statement of the operations and expenditures on the road, for the year ending the 31st October, 1840, the Legislature is respectfully referred to the accompanying reports of the Engineer and Supervisors.

The following is an estimate of the amount required for ordinary and extraordinary repairs the ensuing year:

ORDINARY REPAIRS.

82 miles keying, ditching, &c., at $400 per mile,	$32,800 00	
8200 locust cross-ties, at $1 00,	8,200 00	
875 tons castings, at 80 00,	7,000 00	
		$48,000 00

EXTRAORDINARY REPAIRS.

Bridges,	$600 00	
Wood and water stations,	300 00	
Depots and pivots,	700 00	
		1,600 00
Whole amount,		$49,600 00

The amount drawn from the Treasury during the fiscal year for repairs on the Columbia and Philadelphia railroad, is one hundred and seventy-two thousand four hundred and nineteen dollars and thirteen cents.

MOTIVE POWER DEPARTMENT.

The report of the Superintendent represents the operations of the Motive Power Department as having been relieved from the embarrassments under which it has labored for the last two seasons.

The receipts for motive power for the year ending the 31st of October, 1840, amounted to	$220,993 50
Expenses the same period exclusive of the purchase of engines and ropes,	200,266 83
Excess of receipts over expenditures,	$20,726 67

The following abstract shows the expenditures for the past year :

Parkesburg shop,	$15,217 00
Materials and castings for shops,	20,458 75
Columbia plane,	3,977 18
Schuylkill plane,	7,387 15
Columbia depot,	2,430 69
Schuylkill depot,	596 75
Schuylkill level,	1,963 62
Superintendents, clerks, and car inspectors,	6,001 00
Passenger car agents,	4,514 00
Burthen car agents,	8,206 00
Engineers of locomotives,	14,313 37
Firemen,	9,698 63
Watermen,	6,548 00
Water companies,	1,596 60
Woodmen,	6,555 20
Coal,	23,500 00
Wood,	15,000 00
Rebuilding engines,	14,549 14
Oil,	13,631 90
Miscellaneous,	2,948 56
Horse power at Schuylkill bridge,	5,207 95
	184,978 99
Add amount of debts due,	15,287 84
	$200,266 83

The old debts due for locomotives, ropes, &c. have all been paid as far as ascertained.

Since the interruption necessarily produced by the breaking up of the past winter, the business of the Motive Power Department has been conducted with promptness and despatch. With that increase of transportation which may be reasonably expected from a revival of trade, it has been rendered certain that the receipts for motive power will in a short time be more than sufficient to meet its expenditures of every description.

ROAD TO AVOID THE COLUMBIA PLANE.

One track of this road was opened for transportation on the 4th of March last, at which time the old road, from its intersection with the new, together with the plane, were abandoned. The first section of the Act of the 11th of June, 1840, "to provide for the improvements of the State, and for the payment of the interest on the public debt," appropriated fifty-eight thousand dollars towards the completion of this road. The second section, however, enacted that "the laying of the second track on the road to avoid the inclined plane at Columbia, shall not be commenced, or if already commenced, shall not be progressed with, nor any alteration in the route through Columbia made, until all the debts now due are fully paid, or money set apart out of the appropriation contained in the preceding section for the payment thereof." The debts due being nearly equal to the appropriation, no portion of it could, under this restriction, be applied to the completion of the road, and there consequently remains but one track to accommodate the trade at the western termination of this important thoroughfare. This state of things produces great inconvenience and delay in transportation, especially at those seasons when business is brisk, and time of great importance as well to the agents of the Commonwealth, as to the mercantile community. Frequently several trains are detained at the same time at the intersection of the old and new routes, until the trains passing eastward shall have arrived at the double track. These trains are thus thrown simultaneously into Columbia, where, there being no siding upon which to place the cars, much confusion and delay in the regular and speedy despatch of business is necessarily produced. In certain states of the weather, affecting the action of the wheels upon the rails, no arrangement of hours can obviate the difficulty. The evil is incident to a single track at the termination of a long line, and can only be remedied by the completion of the road, and the construction of the siding referred to.

The estimated cost of the second track and the siding referred to, is as follows :

6 miles 2d track, $11,676, per mile,	$70,056 00
Grading and siding at Columbia (not including damages,)	10,100 00
	80,156 00
Contingencies and supervision,	8,015 00
Total amount required to complete,	$88,171 00

This estimate has been increased to the above amount in consequence of taking the iron from the abandoned road for the purpose of relaying the north track, near Whitehall.

The second section of the improvement bill of last session required the Canal Commissioners "to open and turnpike a street in

the borough of Columbia, on the site of a fourteen feet alley, now running north from Walnut street, between Front and Second streets in said borough, said street to be of the same width as Walnut street aforesaid, and to extend north-westwardly until it enters the street now being opened east of the Pennsylvania canal basin in the borough aforesaid: *Provided*, that the said Commissioners can obtain sufficient ground for the site of said street from the Misses Bethel, who own the adjoining lands, without cost or charge for damages, and also the property, or so much thereof as may be necesssry, belonging to Reuben Mullison, and fronting on Walnut street aforesaid, at a reasonable price, not to exceed in any event the sum of two thousand dollars." The Superintendent of the line reports that this street has not been opened, the sum appropriated for the road not being sufficient to do more than pay the debts due, and the amount stipulated in the act for the payment of damages being less than the property holders were willing to take. He therefore recommends "such an alteration in the law as would make it the duty of the Engineer to locate the street not more than forty feet (instead of sixty) wide, and that the Board of Appraisers, or some other persons, be directed to assess the damages, or compromise them, before the street is opened."

EASTERN DIVISION.

The water was admitted into this division, extending from the junction of the Susquehanna and Juniata divisions, at Duncan's Island, on the 11th of March, since which period the navigation has not been interrupted, except for a few days in the summer, when, from the lowness of the water in the Susquehanna, boats of a heavy burthen experienced some difficulty in passing through the upper levels. The closing the schute, and replacing the gravel in the dam where it had been washed out, soon restored the usual quantity of water to that portion of the line.

The principal repairs upon this division during the present year have been made in a permanent and substantial manner. The outlet lock at Portsmouth was completed in the early part of the season, and will compete as to workmanship and durability with any lock on the public works. In the place of two locks there is now but one, with a chamber of the capacity of one hundred and thirteen feet in length, and eighteen and a-half feet wide, with a lift of seventeen feet. The increased tolls at this lock prove that the alteration will benefit the revenue and add materially to the accommodation of the lumber and other trade which seeks a passage to market through this means of communication with the Pennsylvania and Union canals.

The additional lock at York Haven Ferry is nearly completed, and will, it is expected, be ready for use on the opening of the navigation in the spring. This is a composite lock, built of rubble masonry, and

sheeted with plank. The old lock at this point requires considerable repairs, which, when completed, will give to the levels connected with it the advantage of a double lock.

The weigh-lock at Portsmouth has received considerable repairs. A few further improvements are contemplated, which, with a small expenditure, will render it complete, and obviate many of the complaints which have been urged against it upon account of injury received by boats when weighed in it.

The masonry of the chamber of the outlet lock at Duncan's Island requires re-building. Much inconvenience is experienced, and danger encountered at this point, especially in times of high water, for want of an additional lock, the cost of which is estimated at $12,000.

Several of the aqueducts have received considerable repairs since the last report, but much remains to be done to the whole of them during the ensuing winter. Arrangements have been made to re-build that at Clark's creek, its condition being such as to render it entirely insecure. Stony and Paxton creek aqueducts remain as at the time of the last report, within their arches, sustained by wooden supports and centreing. That over the Swatara will require considerable repair, both to its roadway and trunk. The Conoy and Chicques aqueducts also need some repairs.

Six of the waste-wiers require repairs, estimated at about $100 each. The one in the level above the Buck Tavern, will have to be re-built, and an additional one is much needed in the level below York Haven Ferry. Those between Clark's Ferry and Harrisburg, and one near Columbia, were renewed previous to the opening of the navigation.

Several of the bridges between Harrisburg and Clark's Ferry have been entirely re built with an increased span, so that the prism of the canal cannot, as heretofore, be obstructed by the abutments. Many others between Clark's Ferry and Columbia, require immediate repairs, and eight will have to be re-built. The new towing bridge across the basin at Harrisburg, referred to in the last annual report, has not been commenced. It has, however, been put under contract, and will be completed when the repair fund will warrant it.

The propriety of doubling the locks on this division, has been frequently urged upon the attention of the Board, and as frequently submitted to the decision of the Legislature. The opening of the Tide Water canal, affording an additional outlet to market for the produce of the Susquehanna and Juniata. The rapid increase in the mining of coal, and the manufacture of iron on the North and West Branches, the completion, at no distant day, of the Wisconisco canal, giving an easy access to the rich coal fields of Lykens and Bear valleys, and the widening of the locks of the Union canal from Pinegrove to Middletown, now about being commenced by the company, will throw upon this division of the public works an amount of tonnage exceeding the capacity of single locks to pass it without a serious loss of time to the transporter. If the Legislature should be of the opinion that the finances will warrant the doubling of these locks, an appro-

priation would only be necessary in the first instance to construct those separating short levels.

The amount required for repairs is as follows:

Repairs of six waste-weirs,	$600 00
" Bridges,	650 00
" Swatara aqueduct,	1,000 00
" Conewago,	400 00
" Chicques,	150 00
" Outlet lock Duncan's Island,	500 00
" Original lock York Haven ferry,	2,000 00
" Weigh-lock at Middletown,	450 00
18 pairs lock gates and other repairs,	4,100 00
Vertical wall at Peters' mountain,	600 00
Repairs of culvert above Bainbridge,	100 00
Repairs of feeder head gates,	250 00
Forty-five miles canal and towing path, $200 per mile,	9,000 00
Repairs of feeder culvert,	100 00
Total amount of ordinary repairs,	$19,900 00

EXTRAORDINARY.

Amount required to finish additional lock at York Haven ferry,	6,000 00
Whole amount,	$25,900 00
The amount drawn from the Treasury for repairs during the year ending the 30th day of November, 1840, is	$52,466 93

JUNIATA DIVISION.

A severe ice freshet at the breaking up of the last winter, injured the works on this line considerably, and prevented the opening of the navigation until the 7th of April. The Aughwick, Lewistown and Norths Island dams, the towing path below the Lewistown dam and in the Long Narrows, sustained a great deal of damage. The piers of the rope ferry and the machinery upon them were so much injured by the ice, as to require there being entirely rebuilt above low water mark, which has accordingly been done.

The navigation upon the first ten miles below Hollidaysburg, was seriously impeded for three or four months of the dry season of the year, in consequence of the insufficient supply of water afforded by the streams which feed those levels. Notwithstanding all the water of these streams was used for the canal, the dams being reported perfectly tight, and no water running over their weirs, it was frequently difficult to maintain a depth of more than two feet of water in this

portion of the line. Much delay was consequently experienced in the passing of boats. The necessity for the completion of the Eastern reservoir is therefore apparent. This reservoir will afford a constant supply of water, so that the original capacity of the canal can at all times be maintained, the vexatious delay and expense encountered by the transporters in dry seasons will be obviated, and a higher character given to the main line of improvement between the eastern and western waters.

Eight of the uncovered aqueducts have been rebuilt, and one other is now in the course of completion. Two spans of the Jack's narrows, and one span of Shaver's ford aqueducts, have likewise been re-built.

Many of the locks on this division are in a bad condition, and require considerable repairs. The lining having decayed, must be replaced without delay. The uncertainty of an early appropriation for repairs at the last session, rendered it impossible to obtain the materials for the repair of the locks most needing it, so as to prosecute the work during the last winter and spring.

The construction of a guard-lock in the narrows below Lewistown, has been delayed in consequence of the scarcity of funds. The Engineer reports that the guard-gates at present there, "are so much dilapidated and out of repair as to be utterly worthless."

The waste-weirs require general repair; many of them are now enterely unfit for use. To lessen the expense of re-building them, the officers have adhered to the old plan of wooden abutments.

The dams are reported as in good order, and requiring very trifling repair.

Thirty-five bridges have received new superstructures, and twenty-five stone abutments substituted for wood. There are still twenty-five bridges on this line which require to be re-built.

The following is the estimated cost of repairs on the Juniata Division, for the ensuing year:

Canal and embankment,	$12,000 00
Locks,	28,000 00
Aqueducts,	15,900 00
Waste-weirs,	6,450 00
Bridges,	6,600 00
Dams,	750 00
Ferry at North's Island,	300 00
Total estimated cost,	$70,000 00

The amount drawn from the Treasury for repairs on this division, for the year ending the 30th of November, 1840, is $85,275 56

ALLEGHENY PORTAGE RAILROAD.

REPAIR DEPARTMENT.

The operations upon this road have been conducted during the past year in the most satisfactory manner, without either delay or accidents.

The system of inserting additional cross-ties so as to preserve the proper adjustment of the road, and to prevent the spreading of the rails has been continued. Nearly seven thousand locust cross-ties were inserted during the year. The plan will be adhered to until the whole line has received this necessary security.

In their last annual report, the Board stated, that from the natural decay of the timber on the inclined planes, the whole of the tracks required immediate renewal. The Engineer reports that "not more than one-fourth of the work required for renewal has been done this season." An urgent necessity exists for completing these tracks as speedily as possible, and it is estimated that at least $10,000 will be required for that purpose during the ensuing season.

Many of the slope-walls and much of the masonry connected with the stationary engines require repairs.

Some difficulty is encountered in keeping up a regular supply of water for the use of the locomotive and stationary engines. The water is brought to the stations from streams or springs in the vicinity, through the medium of wooden pipes. These pipes, besides being subject to be frozen up from the necessity of keeping them near the surface of the ground, soon decay and become unfit for use, thus causing a heavy expenditure. It is proposed, as well with a view to the reduction of the annual expense for this purpose, as to furnishing a constant supply of water, to substitute *cast-iron* for wooden pipes, as fast as the latter require renewal. The supply of water at planes Nos. 4 and 5, fails in dry weather. An extension of the means of supplying these two stations with that article is absolutely necessary.

For a detailed statement of the condition of the road, and the repairs required, the Legislature is respectfully referred to the report of Wm. E. Morris, Engineer of the line.

The following is the estimated amount required for repairs the ensuing year:

Maintaining superstructure of road,	$14,000 00
Repairing inclined planes,	10,000 00
Castings,	4,000 00
Masonry,	6,500 00
Pipes,	2,000 00
Depots, engine house, turn-outs, &c.	2,500 00
Total estimated cost of repairs for 1841,	$39,000 00

The amount drawn from the Treasury for repairs on this line for the year ending the 30th November, is $96,168 52

MOTIVE POWER DEPARTMENT.

The operations of this department have been conducted during the past season with as strict a regard to economy as possible; and had it not been for the general depression of business its receipts would have exhibited a considerable balance over its current expenditures.

The expenditures from the 1st of November, 1839, to the 31st of October, 1840, amounted to	$84,708 29
The receipts for the same period were	81,513 57
Showing a deficiency of	$3,194 72

This deficiency is in part accounted for by the fact that, under a resolution of the Board, the canal, railroad and motive power toll upon passengers carried westward in a certain description of boats and cars, was commuted and paid in full at the offices in Philadelphia and Columbia, a part of which, under the old regulations would have been paid at Hollidaysburg, and carried to the credit of the motive power fund of the Portage railroad.

As an evidence of the system of economy adopted by the Superintendent, it may not be out of place to refer to the difference in the cost of splitting and sawing wood at the different stations in the years 1838 and 1840.

In the first named period a foreman and hands were employed by the day at each station to do the work; since then, it has been performed by contract.

The estimated cost of sawing and splitting wood, was, in 1838,	$8,624 23
In 1840, it amounted to	1,333 59
Making a saving to the Commonwealth in this one item over 1838, of	7,290 64

Two new locomotive engines of the first class, were placed on the road the present season, and several more will be required for the prompt despatch of business. Many of the old ones, from their having been long in use, being so much out of order, as scarcely to be worth repairing.

A material improvement has been made in the quality of the ropes purchased for the use of the planes. Heretofore it was generally necessary to renew them every year. Those now on hand, it is estimated, will last a year and a-half from the time of their being put in use, which will make a considerable saving in the expense of keeping up the planes. Three new ropes will be required for the season of 1841.

In their last report the Board recommended the repeal of the act of the 15th April, 1834, giving individuals the right of placing cars upon the railroads for the conveyance of passengers, and that that

business should hereafter be conducted by the Commonwealth. The Superintendent of the Portage road, in his accompanying report, strongly urges the adoption of this measure as calculated to "afford greater safety to passengers; more uniformity in the police of the road; and a very considerable addition to the income of the Commonwealth," as a measure not only of ultimate benefit to the revenue derived from tolls, but as giving increased facilities in the transportation of produce and merchandise at a less cost than the present. He also suggests the propriety of purchasing trucks for the conveyance of the three and four section canal boats over the road. This suggestion is well worthy of consideration. At a period when the States to the north and south of us are making gigantic efforts to secure to themselves the vast trade and travel between the east and the west, it is no more than a wise and judicious policy on the part of the authorities of Pennsylvania, to make her improvements as perfect as possible, especially when the objects to be accomplished will add to the resources of the treasury, and lessen the burthen imposed upon the people for the support of government. One of the chief objections to the main line of our public works, is its mixed character, being composed of alternate lines of canal and railroad, and causing, as it must necessarily do, serious delay and considerable expense in the several transhipments.

Such a mixed line of communication requires those engaged in the business of transportation, as at present conducted, to be possessed of large capital, which, added to the expense and inconvenience of agencies, at the points of transhipments, prevents persons of small means from engaging in the business, and thus, in fact, rendering the carrying trade a monopoly. The effect of encouraging individual enterprise, by enabling every one who may own a boat, to load at Philadelphia and deposit his cargo at Pittsburg, without breaking bulk, or without the intervention of agencies, would assuredly be, by the reduction of tolls consequent on the completion which would ensue, to secure to our works a large portion of the trade which now seeks other channels. If the proposed plan should be found to answer the object intended, it should be applied both to the Columbia and the Allegheny Portage roads. The subject is, however, only referred to at this time as a matter for future deliberation.

The Board recommend the following appropriations for the motive power on the Portage railroad:

For the purchase of three new ropes,	$10,000 00
" " " Locomotives,	15,000 00
	$25,000 00

WESTERN DIVISION.

This line was opened for navigation on the 14th of March. On the 3rd of May, a breach occurred about sixteen miles above Pittsburg, which entirely carried away a large culvert, and about ten thousand yards of embankment, and stopped the transportation upon that portion of the line for about two weeks. The difficulty of repairing this breach was increased by the fact that no appropriation bill had then passed the Legislature, and the uncertainty of obtaining funds from the treasury, rendered it almost impossible to obtain the necessary materials. Funds were, however, obtained on the individual responsibility of a member of the Board, who happened to be present, and the Supervisor of the line, and the work completed in a space of time reflecting great credit on the industry and perseverance of the officer having it in charge. Considerable interruption likewise occurred to the navigation in July, August, September and October, on the upper portion of the division, from the lowness of the water. This was remedied as far as practicable, by the tightening of the dams, but from the insufficiency of the supply of water to the upper levels, the capacity of the canal cannot be maintained in very dry seasons, until the western reservoir, now under contract, shall have been completed.

This division was much improved the past year, by the removal of bars and deposites from the bottom of the canal, and by the substitution on the inner slope of the banks, about twelve miles of the line, of a slight slope wall for the former rip-rap facing of loose stone. The effect of this latter improvement will be to maintain the proper width of the canal, and thereby ultimately lessen the annual amount required for repairs. It is proposed to continue this plan of slope walling, at points requiring it, during the next year.

The Allegheny and Monongahela branches at Pittsburg, have been cleared out, and the locks repaired, and the latter only awaits the completion of the Grant's Hill tunnel, to be in good order for navigation.

The arching of Grant's Hill tunnel is nearly completed. A further appropriation will be necessary to pay the balance due the contractor, and for making the embankment above the arch. The cost of raising the embankment to the original height of the ground will be two thousand five hundred dollars.

The appropriations will then be—		
Cost of tunnel,	$6,500	
Deduct amount appropriated,	5,000	
Amount due contractor,		$1,500
Cost of raising embankment to the original surface of the ground,		2,500
Amount required to finish the work,		$4.000

Two of the locks reported last year as requiring re-building have been put under contract. Three others are in such a dilapidated and insecure condition that they must be re-built without delay. Many of the locks need new sheet-piling, and the renewal of their gates.

The ice freshet of February last, destroyed eleven towing path bridges, and did some injury to Dams Nos. 1, 3, 4, and 6, which has been repaired. The only necessary repair required to the dams, is gravelling.

The aqueduct at the tunnel leaks considerably, and must be caulked and new sheet-piled. The other aqueducts require but small repairs.

The re-building of forty-four bridges has been placed under contract. Eleven others are in such a condition as to require to be re-built immediately.

The waste-weirs, culverts, and lock-houses, require some repairs.

It is estimated that the amount required for repairs on the Western Division the ensuing year, will be as follows:

Grant's hill tunnel and filling arch,	$4,000 00
Locks,	64,000 00
Dams,	500 00
Aqueducts,	3,000 00
Bridges,	5,000 00
Waste-weirs and culverts,	1,000 00
Lock-houses,	1,000 00
Total amount,	$78,500 00

The amount drawn from the Treasury for repairs for the year ending the 30th of November 1840, is $75,712 43

BEAVER DIVISION.

This division, which will ultimately connect the present main line of the Pennsylvania improvements with the waters of lake Erie, has been extended since the last report to Greenville, in Mercer county, by the opening for navigation of forty-two miles of the Shenango line of the Erie extension. It has likewise been made to connect with the waters of that lake at Cleaveland, by the completion of the cross-cut canal which intersects the Ohio canal at Akron. Its importance therefore is daily increasing; and when the extension to the town of Erie is completed, and two channels of ingress and egress to the Pennsylvania improvements is afforded to the vast trade of the Lake country, it will become one of the most profitable in the State. With a view of preparing it for the transportation of this trade, considerable expense has been incurred during the two past seasons in putting it in proper repair.

There is a balance due for labor performed and materials furnished in 1839 and 1840, of thirty-three thousand three hundred and twelve dollars.

The estimated cost of repairs for 1841, is $17,074. The amount drawn from the Treasury for repairs, during the year ending the 30th November, 1840, is, $46,506 71.

FRENCH CREEK DIVISION.

FEEDER LINE.

This line, which is intended as a feeder to the reservoir at Conneaut lake, for the supply of the Conneaut and a portion of Shenango lines of the Erie extension, will require heavy repairs before it can be put in order to answer its original purpose. The Erie extension, when completed, will of course be comparatively useless, unless this line is sufficiently repaired to ensure the necessary supply of water. It is therefore proper that these two works should be completed at the same time.

This line has not been used for navigable purposes since the breaking of Bemus' dam in 1837, and but little repairs have been made upon it for the last two years.

The Board, under the authority given them in the 4th section of the act of the 19th July, 1839, determined, after mature deliberation, that the interests of the Commonwealth would be best promoted by re-building the feeder dam on its old location at Bemus' mill, instead of carrying it two miles further up the creek to M'Guffin's falls. The work has consequently been let, and the contractors are preparing materials and will commence operations the ensuing season. The cost of rebuilding the dam at the proposed location is estimated at sixteen thousand four hundred and twelve dollars; whilst at M'Guffin's falls the cost would have been increased to thirty-three thousand and seventy-five dollars.

In consequence of the necessity of raising the surface of Conneaut lake eleven feet, being three feet higher than was originally contemplated, the height of the towing-path of the feeder line must be increased an average of about eighteen inches, for a distance of twelve miles. A new lock must likewise be constructed at the outlet of Conneaut; the old wooden lock at this point having become useless, was taken down last summer.

The present aqueduct over French creek is unfit for use, and must be rebuilt preparatory to letting the water again into the feeder. The trunk will be widened from 15 to 35 feet, in accordance with the plan adopted by the Board in relation to uncovered aqueducts. The present aqueduct has four spans of sixty feet each, and rests upon two abutments and three piers. It is proposed by the Engineer to construct one "of two spans of one hundred and twenty-five feet each, upon the arch and truss principle, with a trunk entirely new. This

can be accomplished by taking down and extending the abutments and centre piers at one end, using the materials in the two discarded piers for the additional masonry." The estimated cost of the new aqueduct, is nineteen thousand six hundred and seven dollars and fifty cents. Considerable repairs are likewise required to the aqueduct over Watson's run, the trunk of which must be renewed and widened, and the abutments extended.

The waste-weirs and bridges generally require renewal, and the prism of the canal must be cleared out and straightened.

The amount estimated to put the French creek feeder in complete repair is as follows:

Feeder dam at Bemus' mill,	$16,412 00
Aqueduct over French creek,	19,607 50
Do. do. Watson's run,	3,140 00
Waste-weirs,	8,400 00
Bridges,	18,750 00
Repairing and straightening canal,	22,500 00
Raising towing-path on twelve miles,	6,750 00
Out-let lock and guard gates,	11,000 00
Total amount,	$106,559 50

The amount now to be appropriated to this line should bear a proper proportion to that for the Erie extension, so as to enable the officers of the Commonwealth to finish and bring these two connected works into use at the same period.

The amount drawn from the Treasury for the year ending the 30th of November, 1840, is included in the sum drawn for the Franklin line.

FRANKLIN LINE.

This line, extending from the aqueduct over French creek to the town of Franklin, at the junction of that creek with the Allegheny river, remains in the same condition as at the date of our last report: no repairs having been made the present season, except such as were absolutely necessary to preserve the works from destruction.

The condition of this line is a just cause of complaint on the part of the inhabitants residing on its borders, who seek a passage for their produce or merchandize by means of the waters of French creek. The construction of the canal cut them off, in a manner, from the use of the channel in the creek, and the navigation on that canal has now become such as to be almost useless. The upward navigation of the creek is destroyed, whilst that downward is reported to be unsafe. The time has now therefore arrived, when, in justice to the people of that section of the country, the Legislature should determine whether the line is to be repaired or abandoned. The Board, in their last report, gave their views briefly in favor of putting the line

in a condition fit for public use. From those views they have seen no reason to depart. The subject, however, is again submitted to the discretion of the Legislature.

If it should be determined to place this line in complete repair, the following sums will be required for the purpose :

New canal at Sugar creek dam,	$54,513 00
Completing 1¼ miles canal above dam No. 4,	12,381 36
Locks,	27,530 00
Bridges,	4,050 00
Dams,	27,300 00
Repairing and raising towing path,	6,000 00
Total cost of repairs,	$131,774 36

The amount drawn from the Treasury for repairs of the Franklin line, for the year ending the 30th of November, 1840, is $5,000 00.

SUSQUEHANNA DIVISION.

Navigation was maintained on this division during the season without any material interruption. But few repairs other than those of an ordinary character have been made since the last report.

The aqueduct over Penn's creek is still in an unfinished state.— The contractors to whom it was first let, after making some progress, abandoned the work. It was re-let during the last spring, but the contractors, from the sickness which prevailed in that section of the country, and a scarcity of hands, were not able to prosecute it with the despatch, which, under other circumstances they would have done. It will, however, be ready for use the ensuing spring.

The additional feeder from the pool of Shamokin Dam, intended to increase the supply of water to the upper level, which has heretofore been difficult of navigation in dry seasons, is nearly completed.

The defective parts of three lock walls have been taken down and rebuilt.

The character of the repairs yet to be made on this line, and the amount required to complete them, is exhibited in the following estimate of the Engineer :

Repairs to locks and water-ways,	$9,417 00
" Shamokin dam,	30,600 00
To complete feeder from Shamokin pool,	1,720 00
" " Penn's creek aqueduct,	13,383 00
Mahantongo aqueduct,	200 00
Renewing and repairing bridges,	7,200 00
Rebuilding and repairing waste-weirs,	2,495 00
Total amount,	$65,015 00

The amount drawn from the Treasury for repairs for the year ending the 30th of November, 1840, is $28,961 98.

NORTH BRANCH DIVISION.

Navigation commenced on this line on the first of April, 1840, and was continued until the first of July, when the water was drawn off for the purpose of re-building the locks, and was not let in again until the first of October.

This division has received very heavy repairs during the past season. The Board stated in their last annual report, that contracts had been entered into "for re-building all the wooden locks on the North Branch Division, the aqueducts over Mill Creek and Lodge's Run, all the defective bridges, and for constructing a substantial towing path along the pool of the Nanticoke Dam." Owing to the lateness of the season at which the contracts were made, the difficulty in obtaining materials, in consequence of the lowness of the water in the river, the uncertainty as to the time of procuring funds, and the abandonment of their jobs by several of the contractors, who had taken them at inadequate prices, it was determined not to commence the most important repairs during the last winter, from the conviction that they could not be completed in time for the spring business. They were accordingly deferred until that period of the year when but little inconvenience could be experienced from the suspension of navigation. Agreeably to previous notice, the water was drawn off on the first of July, and the repairs commenced.

By the most indefatigable exertions, the difficulties arising from a scarcity of hands, the shortness of the period allotted for the completion of the work, and the apprehension of a deficiency in the appropriation, were overcome, and all the lift-locks from Northumberland to Nanticoke Dam, and the aqueduct over Lodge's run, were so far completed as to permit a resumption of navigation on the first of October. The admirable manner in which this work has been constructed, and the short space of time in which it was accomplished, notwithstanding the many serious obstacles which were encountered, entitle the officers who superintended it, and the contractors who executed it, to the highest praise.

These locks are built upon the composite plan of stone lined with wood. Two of them are completed, the remainder have not received their coping, and likewise require the finishing of some of the masonry of their wings. The guard-lock at Nanticoke Dam is nearly completed. It has been located on a new site, and will render the entrance to the canal of easier access than it has heretofore been in times of high water.

Three of the towing path sections along the pool of the Nanticoke Dam have been completed, the others are in progress.

Lodge's run aqueduct, which was brought into use on the first of

October, at the same time with the locks, is nearly finished. It having been found impossible to complete the aqueducts over Mill creek in time for the resumption of navigation in October, the Engineer reports that a "temporary wooden trunk was thrown across, to feed the canal from this point to the outlet into the Nanticoke pool. It was not intended to last longer than the close of navigation this fall. The next spring flood will probably carry it away; and unless there should be an early appropriation to complete the aqueduct, there is every reason to believe there will be no navigation between Wilkes-Barre and the head of the Nanticoke pool in the spring."

These repairs have necessarily involved a heavy expenditure beyond the amount which it was found expedient to allot to this line, from the appropriation of last year. It was the only course, however, which could have been pursued consistently with a due regard to the public interests. Had the repairs been longer delayed, the navigation must have been entirely suspended, and the rich mineral regions bordering on the valley of the North Branch, from its mouth to the Lackawana, would thereby have been thrown upon the precarious navigation of the river for an outlet for their valuable products. Theday is not far distant when the local trade of this division must yield a handsome revenue in tolls. The recent successful experiments of making iron with anthracite coal, as a fuel, have given a new impetus to that business, and we already find capitalists investing large sums on the North Branch in the purchase of coal and ore beds, and the erection of furnaces, &c. which give fair promise that this district must eventually become one of the principal seats for the manufacture of iron in the State. Although the navigation was suspended for three months the past season, the tolls received for the fiscal year equal those of the last.

The estimate of the sum required to pay the amount due contractors and for ordinary repairs, and to finish the work under contract, is as follows:

Amount due contractors and for ordinary repairs,	$79,809 11
To finish work under contract,	44,771 83
Total,	$124,580 94

In addition to this amount, the engineer estimates that there will be required,

To renew the defective bridges on the line,	$3,870 00
To renew waste-weirs,	1,000 00
" water-ways,	3,500 00
To complete shute at the Nanticoke dam,	500 00
For ordinary repairs,	9,500 00
	$18,370 00

For a more detailed statement on this line, and of the repairs required, reference is respectfully made to the accompanying report of the Engineer, A. B. Warford, Esq.

Nothing has been done to the Lackawana feeder dam, no definite action having been taken by the Legislature at its last session, on the proposition to rebuild it farther up the valley. The old dam was swept off by the flood in the spring of 1839, and the navigation has since been maintained by means of a brush dam. This, from its frail character, is liable to be swept away. It must therefore be rebuilt in a more permanent manner. By reference to the report of last year, it will be seen that the estimated amount required to rebuild it about two miles higher up, on the site of the old forge dam, the point desired by the inhabitants of Lackawana valley, and extending the canal down to the present head of the feeder, is ninety-six thousand dollars, whilst the cost of rebuilding it at a location about one-third of a mile above the old dam, would amount to eleven thousand seven hundred dollars. As this is a question in which the inhabitants of Lackawana valley have expressed a deep interest, the Board have thought it proper to submit it once more to the decision of the Legislature. The importance of keeping up the navigation on that portion of the line above the head of the Nanticoke pool, requires that early action should be had on this subject.

The cost of rebuilding this dam must be added to the foregoing estimate for repairs.

The amount drawn from the Treasury for repairs on this division, for the year ending the 30th November, 1840, is one hundred and nine thousand four hundred and ninety-one dollars and forty-seven cents.

A former Board, in their report of the 9th December, 1837, state that, "that part of the North Branch Division, comprised between the Nanticoke dam and Northumberland, (51 miles) is supplied from the Nanticoke dam. When the improvements upon this branch shall be completed to the New York State line, and the business becomes more active, doubts are entertained whether this length of canal can be supplied fully from the Nanticoke dam. The proper engineer was therefore directed to make an examination in relation to the best means of creating a supply of water when needed, which resulted in recommending the introduction of Fishing creek. In this the Board concur, and respectfully urge upon the Legislature the propriety of conferring the proper authority to have the feeder located, with a view to prevent any further improvements upon it by individuals, under the impression it will never be required by the State. This course may prevent additional expense in the item of damages."

The Bloomsburg Railroad Iron Company, who own a large portion of the water power of this creek, are about erecting expensive works upon it, which would be materially affected by hereafter taking in the stream as a feeder to the canal, and consequently subject the State to heavy damages.

It is therefore of importance both to the owners of the water power and the Commonwealth, that immediate action should be had on

the subject. If the Legislature should determine that the feeder should be constructed, the authority to locate is all that will be required at this time.

WEST BRANCH DIVISION.

This division has not suffered any interruption since it was opened for navigation on the 17th day of March. The operations for the year, exhibit a gratifying increase of tolls, and show that whilst the aggregate amount of revenue from the public works has been diminished by the depression of business, the local trade on the branches has swelled the receipts to a larger amount than any previous year.

The collections on the West Branch for the year 1839, were as follows:

Northumberland,	$20,981 74
Williamsport,	6,204 47
Dunnstown,	7,537 23
Total, 1839,	$34,523 44

For 1840, they were as follows:

Northumberland,	23,280 16
Williamsport,	7,960 64
Dunnstown,	12,309 89
Total,	$43,550 69
Deduct tolls 1839,	34,523 44
Increase of 1840 over 1839,	$9,027 25

The repairs to the Bald Eagle and Dunnstown dams, and to the aqueduct over Pine creek, have been finished.

The Muncy dam required considerable repairs to prevent its destruction, and to preserve the necessary quantity of water in the levels below it. A portion of it was repaired during the season; much more remains to be done to render it secure.

The dam across Loyalsock creek requires new covering and some other repairs. The works connected with this dam being so low as to be liable to inundation at times of high water, the Board in their last report recommended the raising of the embankments. That recommendation is now renewed. The difficulty of maintaining a sufficiency of water in the level below Loyalsock creek, in consequence of the large quantity drawn off for the use of Stevenson's mill, should be obviated as soon as practicable. This can only be done by stopping the supply at the mill, and the consequent payment of heavy damages, the purchase of the property, or the construction of a weir across the head of the mill race, near top water line of the canal, so arranged as to protect the flats below from injury in time of high water.

The cost of adopting the last mentioned plan is included in the Engineer's report.

The dam across the river at Lewisburg, and the cross-cut connecting it with this division, have received no repairs during the year. The lock walls require rebuilding, and the dam must be raised one foot and tightened before it can again become useful for the purposes of navigation. At present it is useless, and the inhabitants of Lewisburg and the rich valleys on that side of the river, are compelled to transport their produce and merchandize across the toll bridge at that place, before they can reach the canal. If it be determined to repair these works the ensuing season, the sum of twenty-five thousand dollars will be required for that purpose.

The aqueducts, locks, bridges and water-ways on this line, require considerable repairs.

The Board, in their last annual report, called the attention of your Excellency and the Legislature to the condition of the Bald Eagle and Spring creek navigation, but as no action was had on the subject at the last session, we cannot refrain from again recommending that the small portion of that work remaining unfinished, should be completed at once by the Commonwealth. The whole length of the improvement is twenty-five miles, commencing at the state dam, across Bald Eagle creek, near Mill Hall in Clinton county, and terminating at Bellefonte in Centre county; of this distance, nineteen miles of the lower end of the line have been opened for navigation. On the upper section of six miles, about one third of the excavation and embankment is done, two locks are completed, and another nearly finished. The act of the 7th April, 1835, pledged the faith of the State for the payment of an interest of five per cent. per annum for twenty-five years, on two hundred thousand dollars, the capital stock of the company, and the State has, in pursuance of a subsequent act, become a stockholder to the amount of twenty-five thousand dollars. So that, notwithstanding this improvement is under the control of an incorporated company, every dollar that has been thus far expended in its construction, has been furnished on the faith and credit of the Commonwealth. It is therefore clearly the interest of the State to complete the work, so that the investment already made, may be rendered productive. The State is now compelled to pay to the stockholders an annual interest of five per cent., on two hundred thousand dollars, and does not receive a tithe of the tolls which would accrue if the remaining six miles were finished. The tolls, by existing laws, are pledged to the State to meet the guaranty.

The Williamsport and Elmira railroad remains in the situation represented in the last annual report of this Board. Twenty-five miles have been completed by a private company, and the remaining portion of the road has not yet been put under contract. The whole distance from Williamsport to Elmira, is seventy-four miles, and the road, as located, passes through a country in every point of view favorable to its construction, requiring no grades over forty-five feet to the mile, and without any increase of distance or unusual expense

in avoiding inclined planes. This road, when completed, will be a very important link in the great chain of internal improvements. It will connect the Grand Erie canal at Montezuma, by the Seneca Lake and Chemung canals, with the Pennsylvania canal at Williamsport; and will also tap near its centre, the great railroad now in progress, extending from the Hudson river through the southern counties of New York, to Dunkirk, on Lake Erie. Elmira, the point of connection with the Chemung canal, and the southern railroad, would, by this route, be two hundred miles nearer to Philadelphia than to New York, by the canal, and about seventy miles nearer than by the railroad. These are advantages which this Board think Pennsylvania ought not to overlook. Acts of incorporation, conferring upon companies the necessary powers and privileges, have been granted in both States, and if the present opportunity of effecting this important connection should be neglected, until the laws expire by their own limitation, it may be a difficult task hereafter to obtain from New York, legislation so favorable to the interests of this Commonwealth.

The following is the estimate of the amount required for repairs on the West Branch division the ensuing year:

Repairs to Muncy dam,	$10,710 00
Guard-lock at Bald Eagle,	210 00
Renewing wood work of locks,	2,750 00
" water-ways round locks,	2,700 00
Repairs to Loyalsock dam,	3,925 00
Raising embankment at Loyalsock creek,	2,625 00
Repairs to aqueducts,	900 00
" to bridges,	7,800 00
	$31,620 00

There will likewise be required for new work on old lines, the sum of $1,500 00

The amount drawn from the Treasury for the year ending the 30th of November, 1840, for repairs is $54,750 00

ERIE EXTENSION.

This extension, embracing 105½ miles, which, when completed, will, by means of the Beaver division, connect the waters of Lake Erie with those of the Ohio, is divided into two lines, the Shenango and Conneaut.

THE SHENANGO LINE.

This line is sixty miles in length, commencing at the head of the Beaver division and extending to the summit of Conneaut Lake. It was located in 1838. Forty-three miles of the line, from the head of the pool, six miles above New Castle, to the flourishing town of Green-

Beaver division 30¼
Erie & Conn 105½
135¾
Attly to Beav 30
165¾

ville, were completed and opened for navigation on the 22d of July last, since which period packet and freight boats have been regularly plying on that portion of the line. The work completed proves to have been constructed in a substantial manner.

The remainder of the work from Greenville to the summit of Conneaut lake, has been prosecuted with vigor during the year; and if the appropriation made to it this winter will justify it, the whole line, with the exception of the heavy embankments across Pymatuning swamp, could be completed early in the next spring.

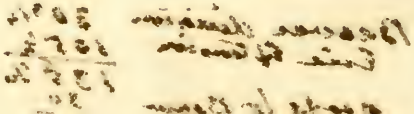
The total estimated cost of the Shenango line is one million six hundred and eighty-one thousand eight hundred and fifty-seven dollars and twenty-six cents. This sum includes twenty thousand two hundred and eighty-eight dollars and ninety-two cents, the estimated cost of repairing sections which have been some time completed, the most of which has been expended.

THE CONNEAUT LINE

Extends from its junction with the Shenango line, at the summit of Conneaut lake, to the borough of Erie, a distance of 45½ miles. A portion of this line was put under contract in 1838, and the remainder in 1839, so that the whole of the work, with the exception of waste-weirs and lock-houses, is now in the course of completion.—The contractors, notwithstanding the difficulty in obtaining funds, have prosecuted their contracts during the year with great vigor and perseverance; and many of them have made heavy expenditures in the opening of quarries and the construction of railroads to their jobs, which have not been included in the estimate of work done.

One half of this line is now finished, and if necessary funds be appropriated for the operations of the next season, it is estimated that the entire water communication between the Ohio and the capacious harbor of Erie, can be completed by the spring of 1842. Until that communication is perfected, that portion of the extension now in navigable order cannot be expected to yield a revenue sufficient to pay the cost of superintendence and repair. When the whole shall have been brought into active operation, it is believed that the advantage anticipated by the early friends of this improvement will be realized.

The total cost of constructing the Conneaut line is	$1,702.977 96
Shenango line,	1,681,857 26
Entire cost of Erie Extension,	3,384,835 22
Deduct former appropriations,	2,166 666 66
Balance required to complete,	$1.218.168 56



NORTH BRANCH EXTENSION.

TIOGA LINE.

This line is thirty-five miles and fifty-six chains in length, commencing at the village of Athens, and extending to Wyalusing creek. It was commenced in 1836, and the whole of it is now under contract. Twenty-eight of the sections, (making an aggregate of seventeen and seven-eighths miles) have been completed. Three of the lift-locks are likewise finished. The remainder of the sections and lift-locks, dams, aqueducts, guard and outlet locks, &c. are in such a state of forwardness as to render the completion of the whole line practicable during the next year, providing the necessary appropriation should be made.

The following summary exhibits the estimated cost of the Tioga line, viz:

The value of work done up to October 31st, 1839,	$840,270 46
The value of work done during the year ending 31st October, 1840,	253,359 45
Total value of work done 31st October, 1840,	1,093,629 91
Value of work remaining to be done,	330,659 20
	1,424,289 11
Add five per cent. for contingencies on work to be done,	16,532 96
Total estimated cost,	$1,440,822 07

This estimate, it will be seen, is higher than that orignally made for this line. This has been caused principally, by the rise of provisions and labor shortly after the commencement, and the inadequacy of the appropriations to ensure a steady and uniform prosecution of the work, compelling many of the contractors to abandon their contracts, which had subsequently to be re-let at higher prices.

The above estimate does not include any thing for an extension from the present head of this line to the New York State line. It was the original design in commencing the North Branch extension, to effect a connection with the improvements of New York. Of the importance of that connection to Pennsylvania, the Board have heretofore expressed their views, and subsequent information confirms them in the opinion, that if the Legislature should now, or hereafter, determine to prosecute the work to that point, we shall be met in a spirit of liberality by the authorities of New York. That State is deeply interested in the connection, affording as it must, an additional and easy outlet for her salt, gypsum, and the agricultural productions of her rich and flourishing territory, bordering on the lakes, and at the same time opening to a large portion of her citizens an access to the coal and iron regions of the North Branch.

An estimate of the cost of extending this improvement to the State line by the Susquehanna, as well as by the Chemung, will be found in the report of the Engineer.

TUNKHANNOCK LINE.

This line is fifty-four miles and nineteen chains in length, and extends from Wyalusing creek to the Lackawana.

No new contracts have been entered into on this line since the last report: the bill of the last session confining the appropriation to work already commenced.

Fourteen of the sections, comprising some of the heaviest, and making an aggregate distance of six miles, are completed, and many of the others are reported to be in such a state of forwardness as to be finished in the early part of the spring.

None of the mechanical work has yet been placed under contract. The sections which have not been commenced are generally of a light character.

The work done on the Tunkhannock line, up to the 31st October, 1840, amounted to	$ 845,285 44
Value of work remaining to be done,	1,267,493 35
Total estimated cost of Tunkhannock line,	2,112,778 79
Estimated cost of Tioga line,	1,440,822 07
Cost of North Branch extension,	3,553,600 86
Deduct from appropriations,	1,946,666 66
Balance required to complete the North Branch extension,	1,606,934 20

For a detailed statement of the operations on the extension, and for some pertinent remarks on the propriety of its completion, reference is respectfully made to the report of the Engineer, William B. Foster, jr. Esq.

WISCONISCO CANAL.

This canal is twelve and one-fourth miles in length, commencing at Millersburg, at the mouth of the Wisconisco creek, and terminating in the pool of Clark's Ferry dam. It was placed under contract in the summer of 1838, and is intended as an outlet for the coal of the valuable mines of Lykens and Bear valleys.

This work is in such a state of forwardness as to render its completion practicable by August next, if the necessary appropriation should be made for the purpose. The appropriation of last session was exhausted on the 15th of August, and the usual notice of the

fact was given to the contractors. Most of them, however, on the presumption that the Legislature would make an early appropriation, have since been prosecuting their respective contracts with their own means and on their own responsibility, so that there is now due them on the first November, the sum of fifty-five thousand and eighty-three dollars and twenty-three cents.

All the sections of this canal have been completed, with the exception of Nos. 7, 8, 22 and 25.

The Engineer, in his report, under date of the 2d November, states the condition of the remainder of the work to be as follows:

Section No. 3 is nearly done and will be completed in about two weeks. Nos. 7 and 8 could be completed in one month. Nos. 22 and 25 could be completed in two months. The guard and lift locks Nos. 1 and 5 are nearly completed, and will be entirely so this fall or early in the spring. Locks Nos. 2, 3, 4 and 6, have been commenced. Aqueduct No. 3 will be completed during the present month. No. 1 has been commenced. Culvert No. 1 is finished; No. 2 nearly so. The abutments of the dam to be erected across the Wisconisco creek have been commenced, and raised so far above the foundation that, even though there should be high water, the contractors will be able to continue the work early in the spring. The abutment walls of bridge No. 17 are completed. Bridges No. 1, 4, 5, 7, 12, 15, 16 and 17, have been commenced.

The work not yet commenced consists of one aqueduct, six bridges, three waste-weirs and six lock-houses.

The following estimate exhibits the amount required to finish the Wisconisco canal:

Value of work to be done,	$91,233 28
Due contractors,	55,083 23
Amount required to complete,	$146,316 51

WEST BRANCH—SINNEMAHONING EXTENSION.

The Legislature having made no appropriation the last two sessions towards this extension, excepting the sum of thirty-four thousand one hundred and twenty-four dollars, to pay the balance due contractors (which has been expended for that purpose,)—the work has consequently been suspended.

Several of the contractors having performed work in the preparation of materials which were not delivered at the time the line was suspended, and which consequently could not be embraced in the engineer's estimate of the amount due, presented at the last session, that officer was directed to estimate and report to the Board the value of the work done in the preparation of those materials. The estimate was accordingly made, and amounts to one thousand two hun-

dred and six dollars. This, under the circumstances, is a just claim against the Commonwealth, and the Board recommend an appropriation for the amount.

This line was placed under contract in 1838. It is thirty-three miles in length, and extends from the mouth of the Tangascootac to the mouth of the Sinnemahoning.

The following estimate exhibits the cost of the whole line, the amount of the work done, and the amount required to complete it, viz:

Estimated cost of the whole line,	$1,388,099 15
Amount of work done,	142,419 99
Amount required to complete,	$1,245,679 16

TANGASCOOTAC EXTENSION.

The dam at Farrandsville, the only uncompleted job on the extension from Dunnsburg to that place, remains in the same condition as at the last report. The completion of this dam is requisite to enable the owners of the mines on the Tangascootac to get their coal to market. Estimated cost, twenty-four thousand dollars.

The repairs to the Queen's run dam, rendered necessary by the freshet of last spring, have been completed.

ALLEGHENY FEEDER.

In consequence of no appropriations having been made to this work at the two last sessions, it has been entirely suspended. It is fourteen miles in length, commences at Kittanning and terminates at the Kiskaminetas aqueduct, and was designed to afford an additional supply of water to the line from that point to Pittsburg.

It was estimated to cost six hundred and sixty-two thousand six hundred and three dollars, of which thirty-one thousand one hundred dollars have been appropriated and expended.

The appropriation of one thousand one hundred dollars, made at the last session of the Legislature, to pay the amount due contractors, has been applied to that purpose, with the exception of a small balance of three hundred and thirty-nine dollars and ninety-seven cents, which remains uncalled for.

GETTYSBURG RAILROAD.

This work was suspended on the first of March, 1839, in pursuance of the provisions of an Act of Assembly of the 19th of February of that year.

The act of the 11th of June, 1840, appropriated one hundred and fifty thousand dollars to pay debts due contractors, engineers and others, for work done on the road prior to the first of March, 1839. Of that amount the officer to whom the duty was assigned, has disbursed one hundred and forty-two thousand one hundred and thirty dollars and eighty-five cents, leaving a balance of seven thousand eight hundred and sixty-nine dollars and fifteen cents, to liquidate debts which have not yet been adjusted. That sum will be sufficient to pay all claims against the road, with the exception of damages to property. Arrangements have been made to assess the damage sustained by such of the land holders as have made application for that purpose.

The cost of the work done on the road, is as follows:

Amount expended by former Superintendent,	$516,666 66
" " " present "	142,130 85
On hand to pay balance of claims,	7,869 15
	$666,666 66

The disposition which is to be made of this road, is a subject requiring the attention of the Legislature.

SURVEYS.

The Board was directed, by the 6th section of the act passed on the 19th of July, 1839, "to employ an experienced and competent engineer, and at least three assistant engineers, with their necessary corps, whose duty it should be, to make thorough examinations and surveys, with a view to form a connection between Harrisburg and Pittsburg, by means of a continuous railroad between those points."

Mr. Charles L. Schlatter, Principal Engineer in the State service, was appointed to take charge of the surveys, and commenced field operations in accordance with the provisions of the act, with three corps of engineers, about the first of September, 1839, and reported to the Board, December 27th of the same year, the result of the surveys so far as they had been conducted, advising the Board, at the same time, that the appropriation would not be sufficient to effect the object of the act.

This information was laid before the Legislature last year, and an act passed increasing the appropriation, also authorising a survey "to ascertain the practicability of constructing a M'Adamised road of an easy grade from some point at or near Chambersburg, to a point west of Laughlinstown."

The Board have every reason to believe, that the surveys have been prosecuted with great skill and vigor, and have proved far more successful than was anticipated. A route has been discovered between Harrisburg and Pittsburg, (designated in the report of the Engineer as the Middle Route,) following the valleys of the Juniata and Susquehanna to the summit of the Allegheny mountain, crossing the

mountain two miles north of the Portage Railroad, and passing thence by the valley of the Black Lick to Blairsville, and from Blairsville, in a very direct course, to Pittsburg, by which the distance has been computed not to exceed two hundred and forty-two miles. On this route no grade occurs having a greater inclination than forty-five feet per mile.

An important discovery has been made during the progress of these surveys, of a railroad line which will connect the Juniata division of the Pennsylvania Canal at Huntingdon, with the canal at Johnstown, avoiding the inclined planes on the Portage railroad, and having no gradient exceeding 45 feet per mile, without increasing the distance more than four miles. It appears from the report of the engineer, that the western descent from the summit of the Allegheny mountain, where the middle route crosses it, can be effected by a line of railroad with no grade exceeding 45 feet per mile, using eight miles of the Portage railroad, and reaching Johnstown with an increase of distance of one mile only.

Another line has been noticed by the Engineer, by which the inclined planes Nos. 1, 2 and 3, can be dispensed with, by making twelve miles of new road over ground of a favorable character for the formation of the road bed. This line also has the gradients limited to 45 feet per mile.

Another route, designated as the Northern Route, has been surveyed from Harrisburg by the valley of the Susquehanna, and the West Branch of the Susquehanna crossing the Allegheny mountain about thirty-one miles north east from Blair's Gap. This has an increase of distance over the middle route; but by referring to the report of the engineer, it will be seen that the route by the West Branch of the Susquehanna has not been sufficiently examined to compare it with that of the Juniata, neither can any fair comparison be instituted, until the West Branch is surveyed to its source in Indiana county, where the lowest summits of the range of the Allegheny mountains are found on the routes from Harrisburg to Pittsburg.

The route designated in the report of the engineer as the Southern Route, comprises all the surveys between Chambersburg and Pittsburg, made with the design of connecting with Harrisburg by means of the Cumberland valley railroad. A survey was made by order of the former Board of Canal Commissioners, in the year 1838, from Chambersburg to Pittsburg, by Mr. Hage, and it appears from the report of Mr. Schlatter, that the line then located has been adopted, from Chambersburg to Laughlinstown, with but few variations. From Laughlinstown to Pittsburg, the grades have been very much improved without any increase of distance.

The limits of the appropriation prevented the examinations from being extended as far as was desirable; but a complete location was made for a M'Adamised road according to the provision of the act, which has proved the entire practicabilty of forming a road with no inclination greater than two and a-half degrees, and with these light gradients, exceeding the length of the old turnpike but eleven miles.

Although continuous lines of railroad have been surveyed upon the three grand routes from Harrisburg to Pittsburg, many routes have yet to be examined before the best line can be determined upon. The Engineer in his report has given a list of the several routes recommended to his attention by the citizens of the State, with the estimated distances to be surveyed on each route; and from the success which has attended the labors of the Engineers employed on this survey, and the knowledge they have acquired of that portion of the State to be traversed by the routes, the Board are of the opinion that these surveys should now be prosecuted to the conclusion, so that no doubt should rest upon the minds of our citizens, as to the best route for this great work, which must prove so conducive to the interests of the State.

The Board cannot conclude the remarks upon this survey without making a few brief observations upon the great importance of a continuous railroad communication between Philadelphia and Pittsburg. The citizens of Boston, Baltimore and New York, and of the States in which these cities are respectively situated, are making great exertions to seize at an early day, and to secure the vast and productive trade of the west and of the lakes. Already railroads are being constructed from Boston to Lake Erie, through the states of New York and Massachusetts. The first link in this chain, the Boston and Worcester railroad, has been in successful operation for some years. The Western railroad, from Worcester to the line dividing Massachusetts from New York, is partly in operation, and will be entirely completed in a short time. This road, joining with the Hudson and Berkshire railroad, connects the Massachusetts lines with those now in progress between the Hudson river and Lake Erie. The New York and Erie railroad, now in progress of construction, will present a continuous communication from Dunkirk on Lake Erie, to the city of New York, by railroad: whilst the completion of the Baltimore and Ohio railroad, will in a great measure divert the trade of the Ohio from its passage through our State to Philadelphia; if the energies of our citizens are not aroused to exertion, and the fact laid plainly before them that a route exists within the borders of our own State by which passengers and produce can be conveyed from the west, and from the lakes, by means of a continuous railroad, with less cost than either of the routes above mentioned.

From a statement in the report of the Engineer, the distance by the shortest route through our State, from Cleveland on Lake Erie, (the point aimed at by all the rival cities,) via Pittsburg and the *Middle Route*, to Philadelphia, is four hundred and seventy-eight miles. The distance from Cleveland to the city of New York, by the New York and Erie railroad, and by the lake, is six hundred and fifty-four miles. As the nearest route from Philadelphia to New York is taken at eighty-five miles, it appears that passengers and produce can be transported from Cleveland to New York, *via Philadelphia* and the New Jersey railroads, with a saving of ninety-one miles of distance over the nearest route which can be obtained through the State of

New York, and possessing the additional advantage of being free from the expense of *transhipment* from the vessels trading between Dunkirk and Cleveland, to the railroad.

The distance by the Baltimore and Ohio railroad, from Pittsburg to Baltimore, (as reported by the Engineers on the preferred route,) is three hundred and forty miles. This is eight miles less than the distance between Philadelphia and Pittsburg; but when we take into consideration the great advantage possessed by the railroad as *now located*, between Pittsburg and Philadelphia, in having no grades exceeding forty-five feet per mile, whilst those on the Baltimore and Ohio railroad are in two instances, over eighty feet, and for many miles sixty-six feet per mile, we find the increase of distance completely counterbalanced by the lightness of the grades, and the *virtual* distance less from Pittsburg to Philadelphia than to Baltimore.

The Engineer, in his remarks upon the lines of railroad yet to be surveyed, has directed the attention of the Board to a route by which a connection by railroad might be formed between the Harrisburg and Pittsburg railroad, and Erie. The line to be surveyed is described as leaving the projected improvement at or near Blairsville, pursuing the Conemaugh and Kiskaminetas, to a point near Freeport, thence by the Buffalo creek, to the Allegheny river, and by the Allegheny river and French creek, to Erie, passing through the counties of Amstrong, Butler and Mercer. By this route the distance from Philadelphia to Erie has been estimated at four hundred and seventy-eight miles.

RESERVOIRS.

The reservoirs on the eastern and western side of the Allegheny mountain, destined to increase the supply of water in the upper levels of the Juniata and Western divisions, were placed under contract in the fall of 1839, since which time the work has progressed as fast as its character and the amount of the appropriations would justify.

The EASTERN RESERVOIR is situated upon the south branch of the Juniata, about a mile and a-quarter from Hollidaysburg. The dam was commenced in April, 1840, and the work has steadily progressed since that period. The castings for the pipes have been partly made, and the remainder will be prepared before the ensuing spring. Owing to the small quantity of timber on the ground, and the scarcity of funds, the clearing has not been commenced.

The estimated cost of this reservoir, exclusive of damages, engineering and office expenses, is one hundred thousand dollars.

The site of the WESTERN RESERVOIR is on the Little Conemaugh river, about ten miles above Johnstown, and two miles from the Portage railroad. It was commenced during the last spring. The clearing is nearly completed, and the pipes cast and now ready for delivery. All the work at the dam below the surface of water in the

stream, has been done except the sluice walls. If the necessary appropriation be made, the work can be completed and brought into use some time during the next summer.

Estimated cost,	$188,000 00
Eastern reservoir,	100,000 00
Total cost, two reservoirs,	$288,000 00
Deduct amount appropriated,	70,000 00
Amount required to complete,	$218,000 00

In the report of last year the amount already appropriated was stated to have been $100,000. The error arose from the supposition that the sum of $30,000, appropriated by the Act of the 18th February, 1836, was still applicable to these works. Subsequent examination, however, has shown, that as the terms of that Act had not been complied with, the appropriation could not be made available.

The importance of these reservoirs has been frequently brought to the notice of the Legislature in the reports of our predecessors, as well as of the present Board. The experience of the last summer exhibited the propriety of their speedy completion in a strong light. From the lowness of the water in the streams which feed the Juniata and Western divisions, the passage of boats heavily laden was much retarded from the early part of July to the middle of October. At times, boats with more than half a load could not be passed; and the necessity for saving all the water was so great that the weigh-locks at Hollidaysburg and Johnstown were closed for six weeks. The delay and expense to the transporter by these interruptions in dry seasons, have been the source of much complaint, and the character of our main line of improvements would seem to demand that the causes which have thus impeded its free and uninterrupted use should be removed without delay. This can only be effected by the completion of the reservoirs.

For a more detailed statement in relation to these works, the Legislature is referred to the report of the Engineer, William E. Morris, Esq.

OLD DEBTS, DAMAGES, AND CLAIMS.

Immediately after a portion of the funds authorized by the improvement Bill of last session were obtained, orders were issued to the disbursing officers on the several lines, to liquidate, without delay, all the debts due for repairs, as well those which occurred previous to the 1st February, 1839, as those which were subsequently contracted.

The damages assessed have been paid so far as the state of the Treasury would permit. There are many cases of this description

now before the Board, which will be disposed of as soon as the proper examination can be made and the requisite information obtained.

The claims referred to the decision of the Board have been generally acted upon and adjusted.

The Board have decided all the claims arising under the resolution of the General Assembly of the 6th of January, 1840, "authorizing the settlement and payment of certificates or scrip issued by John Forsman, late supervisor on the Delaware division of the Pennsylvania canal," so far as they have been presented for settlement; sixteen claims amounting in the aggregate to the sum of nine hundred and ninety-one dollars and fifty cents, have been adjusted and paid.

In the payment of damages done to real estate encumbered by liens, cases have arisen which, in the opinion of the Board, require legislative action. The Canal Commissioners, as well as the Appraisers, in all cases make their offers to the owners of the property without reference to the claims of judgment creditors, mortgagees, or others having liens on the estate. Consequently, awards and payments are sometimes made to the nominal owner, when he has little or no interest in the property damaged: the liens amounting to more than its entire value. Under the present Acts of Assembly regulating the assessment and payment of damages, the Board cannot perceive that they have authority to make payments to any other than the owners of the land. They would therefore respectfully suggest to the Legislature the propriety of enacting such laws as will remedy the evil complained of, by enabling the Canal Commissioners, upon being notified of such liens, to pay the amount due into the Court of Common Pleas of the proper county, to be distributed among the lien creditors, or otherwise disposed of, as the court may direct.

TOLLS.

The amount of tolls collected at the several offices on the canals and railroads of the Commonwealth of Pennsylvania, from November 1, 1839, to October 31, 1840:

CANAL TOLLS.

Easton,	$72,224 22
New Hope,	7,265 88
Bristol,	17,580 12
Columbia,	82,617 13
Portsmouth,	31,095 22
Harrisburg,	25,287 52
Newport,	5,698 55
Lewistown,	15,559 52
Huntingdon,	7,153 31
Hollidaysburg,	68,589 60

Johnstown,	63,041 38
Blairsville,	1,946 63
Leechburg,	4,029 48
Alleghenytown,	43,585 42
Beaver,	2,971 34
Franklin,	653 17
Liverpool,	8,097 73
Northumberland,	23,280 16
Williamsport,	7,960 64
Dunnstown,	12,309 89
Wilkes-Barre,	2,316 41
Berwick,	5,550 10
Columbia outlet locks,	5,213 25
Portsmouth outlet locks,	723 25
Swatara bridge,	503 92
Duncan's island bridge,	2,478 99
Duncan's island aqueduct,	49 04
Kiskaminetas aqueduct,	386 01
Pittsburg aqueduct,	986 09
Junction,	884 94
	$520,038 91

RAILROAD AND MOTIVE POWER TOLLS.

	Railroad.	Motive Power.
Philadelphia,	$117,848 70	$90,243 56
Paoli,	4,256 74	1,322 41
Parkesburg,	14,216 35	15,028 79
Downingtown,	2,473 77	2,731 15
Lancaster,	38,791 82	41,822 73
Columbia,	55,020 94	64,090 16
Hollidaysburg,	34,160 92	39,915 32
Johnstown,	23,857 36	41,200 24
Schuylkill viaduct,	1,418 85	
	$292,045 45	$296,354 36

RECAPITULATION.

Canal tolls,	$520,038 91
Railroad,	292,045 45
Motive power,	296,354 36
Total amount of canal, railroad and motive power tolls,	$1,108,438 72
Deduct drawback on flour,	22,585 00
Actual receipts,	$1,085,853 72

Amount drawn from the Treasury for repairs, for the year commencing November 1, 1839, and ending the 30th November 1840:

Delaware division,	$76,038 06
Columbia railroad,	172,419 13
Eastern division,	52,466 93
Juniata division,	85,275 56
Portage railroad,	96,168 52
Western division,	75,712 43
Beaver division,	46,506 71
French Creek division,	5,000 00
West Branch division,	54,750 00
North Branch division,	109,491 47
Susquehanna division,	28,981 98
Total,	$802,810 79

REPAIRS REQUIRED.

The following is a recapitulation of the amount required for repairs on the several lines of canal and railroad:

Delaware division,	$39,299 00
Columbia railroad,	49,600 00
Eastern division,	25,900 00
Juniata division,	70,000 00
Portage railroad,	39,000 00
Western division,	78,500 00
Beaver division,	17,074 00
French creek feeder,	106,559 50
Franklin line,	131,774 36
Susquehanna division,	65,015 00
North Branch division,	63,141 83
West Branch division,	31,620 00
	$717,483 69
Add amount of debts due for repairs on the several lines,	268,003 00
Total amount required to pay debts due, and to make repairs,	$985,486 69

The following statement shows the estimated amount required to finish the several lines of canal and railroad under contract:

Erie extension, Shenango and Conneaut lines,	$1,218,168 56
North Branch division, Tioga and Tunkhannock lines,	1,606,934 20
Wisconisco canal,	146,316 51
Eastern and Western reservoirs,	218,000 00
Total amount,	$3,189,419 27

EXPENDITURES.

The following is a statement of the amount drawn from the Treasury for all purposes of internal improvement, from the 1st of November, 1839, to the 30th of November, 1840 :

New work on old lines,	$38,348 21
Repairs prior to 1st February, 1839,	84,792 49
Damages,	53,740 06
Grant's Hill tunnel,	3,042 00
Debts due for motive power,	38,708 27
Locomotive engines,	132,614 12
Motive power,	318,005 47
Allegheny feeder,	1,100 00
Construction of new work,	1,914,866 32
Retained per centage,	1,250 47
Doubling locks on Eastern division,	7,402 00
Reservoirs,	67,000 00
Repair of feeder dams,	15,002 17
Survey of railroad route from Philadelphia to Pittsburg,	36,427 68
Gettysburg railroad,	150,000 00
Sinnemahoning extension,	34,000 00
Re-laying north track,	47,682 00
Road to avoid Columbia inclined plane,	91,000 00
Repairs,	802,810 79
Total,	$3,837,792 05

Of the sum drawn from the Treasury for repairs during the present fiscal year, the following balances of appropriations were on hand on the 1st day of November, 1839, but were unavailable, owing to the loan having been paid into the Treasury in instalments, several of which fell due after that day.

For repairs to main lines,	under act of	19th July, 1839,	$175,112 26
For West Branch,	under do	do	34,250 00
For North Branch,	under do	do	57,661 00
For Beaver division,	under do	do	25,000 00
			$292,023 26

That, sum therefore, appropriately belongs to the repairs done in 1839, although drawn from the Treasury after the first of November, the close of that fiscal year.

[NOTE.—The statements of disbursements the present fiscal year are made up for thirteen months, commencing November 1st, 1839, and ending November 30th, 1840. The reports of the officers giving the operations on the several lines close as heretofore, on the 31st of

October, the Board having no knowledge of the change of the fiscal year, until too late to countermand the usual instructions.]

OF APPROPRIATIONS.

The Board recommend the following appropriations for the ensuing year:

For the Erie extension,	$1,000,000 00
" " North Branch extension,	1,000,000 00
" " Wisconisco canal,	146,320 00
" " Reservoirs,	218,000 00
" " completion of the 2nd track of rail-way to avoid the Columbia inclined plane,	88,171 00
" renewing north track to Whitehall,	52,130 00
" repairs on French creek feeder,	100,000 00
" repairs on all the finished lines of canal and rail-road except French creek feeder, and to pay debts already due for the same,	878,000 00
" damages,	30,000 00
" new work on finished lines,	40,000 00
" motive power on Portage railroad,	25,000 00
" debts due on Sinnemahoning line,	1,206 00
	$3,578,827 00

All of which is respectfully submitted.

EDW'D: B. HUBLEY,
WM. F. PACKER,
HUGH KEYS,
Canal Commissioners.

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